Trains

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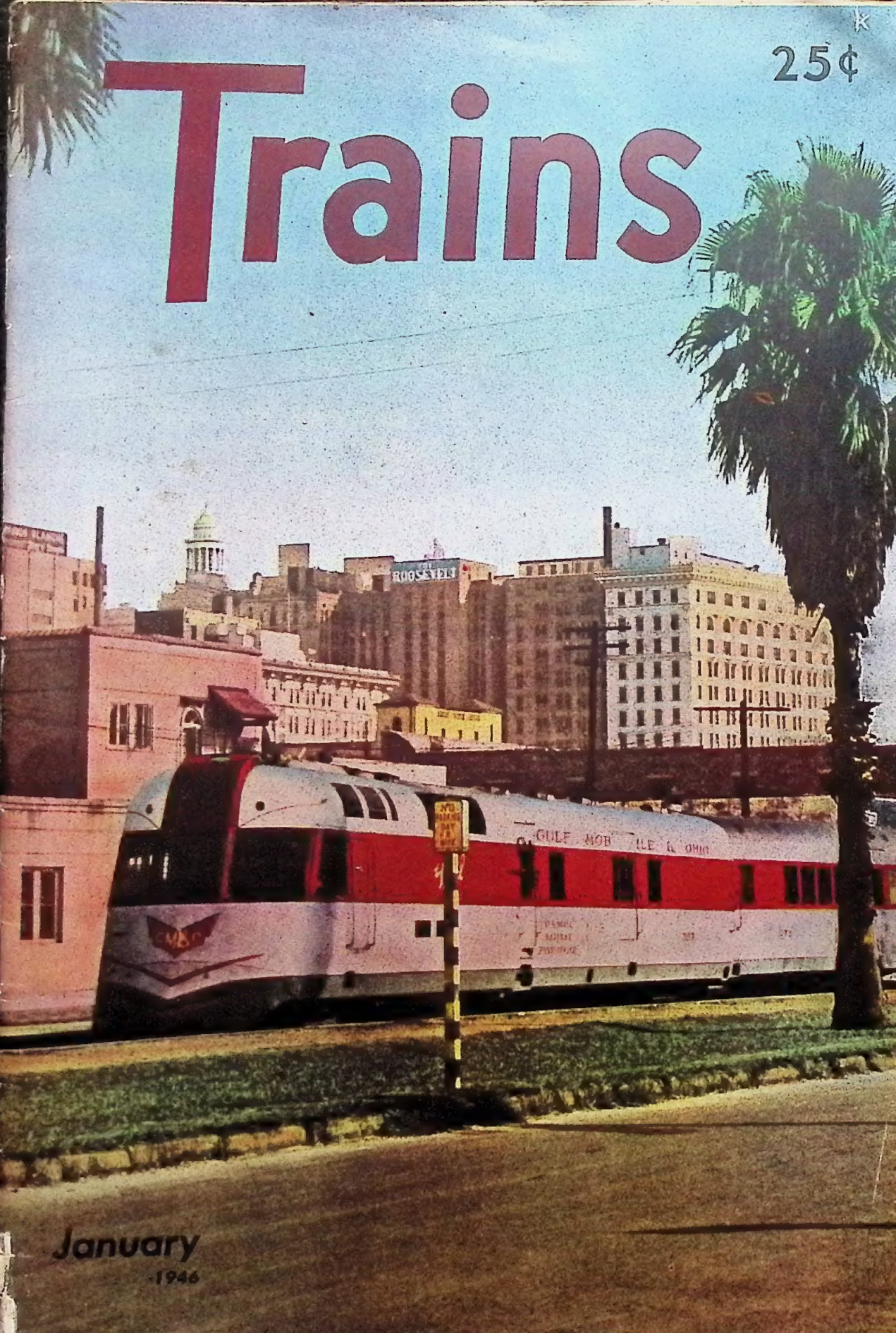

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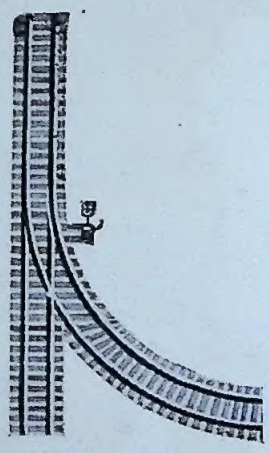

Railroad Dollars Switch Back to All of Us

In their essential service to the nation, the American railroads during 1945 again hauled an enormous tonnage of freight for an average charge of less than one cent per ton per mile, and carried millions of service and civilian passengers for fares averaging less than before the *First* World War. For this job the railroads received less than 9 billion dollars. And here's where the money went:

41% FOR WAGES

This money, paid to 1,400,000 railroad employees, buys homes and furniture, food and clothing, education, insurance—helps make local business prosper.

32% FOR MATERIALS, ETC.

More than two-thirds of these dollars was paid to a broad cross section of industry which furnishes railroad supplies. They help to make better business and more jobs in every state and almost every county in the country.

16% FOR TAXES

Railroad taxes are spent for the general support and services of government—national defense, public safety, schools, hospitals. None of this money is used to provide tracks for trains—although some of it is spent by government to help provide and maintain the highways, waterways, and airways used by other forms of commercial transportation.

6% FOR INTEREST, RENTS, ETC.

The greater part of this was paid to those who have loaned money to the railroads and receive interest in return—including the millions of men and women who have an investment in railroads through their life insurance policies, savings bank deposits and the like.

3% FOR DIVIDENDS

This three cents out of each dollar was paid to about a million individual citizens who have invested their savings in railroad stocks—helping to provide the "tools" with which railroad employees do their work.

2% TO WORK FOR THE FUTURE

That last 2 cents of the railroad dollar is for investment in the better railroads which continuing research is making possible—better equipment—better service—more jobs—to help provide, *for us all*, in better and better fashion, the rail transportation upon which this nation depends.

AMERICAN RAILROADS

Trains

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January 1946

"From Puffing Billy drawing a few wagons of coal at four miles an hour, to Big Boy roaring through the Rockies at better than 70 miles an hour with six or seven thousand tons of freight train strung out behind him, the steam locomotive has captured the imaginations of whole generations of men."—Robert S. Henry in "This Fascinating Railroad Business."

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the vista dome *California Zephyrs* jointly for Burlington-Rio Grande Western Pacific; the vista dome cars for the B&O's Potomac Valley runs, the new Chesapeake & Ohio streamliners for Washington-Cincinnati service, the new trains for both the Seaboard and Atlantic Coast Line Florida routes, the two Pere Marquette trains which will make three round trips daily between Detroit and Grand Rapids, four two-car electric units for the Illinois Terminal main line between Peoria and St. Louis, and six stainless steel Budd-built coaches with which the Minneapolis & St. Louis will give fully modern service on its local runs.

Some already announced orders are being expanded. Texas & Pacific announces that in addition to its part in the *Sunshine Eagles* which it and MoPac will run between St. Louis-Memphis and El Paso, it will also inaugurate the *Louisiana Eagles* connecting from New Orleans. The Pennsylvania is not only ordering cars from outside builders for its share in Florida trains, but is keeping its Altoona Works busy with new equipment for its coach streamliners. Some orders which are known to be coming have not even been definitely announced, though they may be placed. Illinois Central has not been backward about speeding schedules and announcing plans for a daylight Chicago-New Orleans streamliner, but as yet its car orders do not appear in the list. Southern Pacific is known to have plans to put other of its crack trains on a par with the *Lark* and the *Daylights*, but no car orders are yet listed.

Plenty will happen in the coming year. Not only will radically new equipment go into service in all parts of the country, but every month will see dozens of new announcements by railroads and car builders. For truly the orders now placed are only the beginning.

Rio Grande 75th Anniversary

The D&RGW made good use of its colorful history and the scenic country through which it operates in celebrating its 75th anniversary. A special anniversary train was made up, pulled by a 5400 horsepower freight Diesel, and carrying on flat cars six representative pieces of narrow gauge equipment including a locomotive. Following the narrow gauge display came the Burlington vista dome car, a preview of the dome cars for the new *California Zephyr* which will operate over the Grande's Moffat Tunnel route. Then came a stage car, used to present a Gay Nineties revue at stops, and a radio equipped caboose. Some people who saw the train swore that the little narrow gauge engine was pushing the big Diesel.

The Rio Grande was incorporated October 27, 1870, with the intent of building southward along the front range of the Rockies into Mexico and to Mexico City. Instead the line was swung west from Pueblo and the railroad became the route that's "through the Rockies, not around them." The main line was at first three-foot gauge, and the project was called the "baby railroad." Moving force in building the system was General William Jackson Palmer who already had a brilliant railroad career behind him when at the age of 34 he started the Grande.

Diesel Locomotives in More Powerful New Models

The most powerful single unit Diesel locomotive in the world has been delivered to the Seaboard Railway by Baldwin Locomotive Works. It is radically different from any previous road Diesels, especially in running gear. Instead of being mounted on two swivel trucks, passenger car style, it is carried on two long locomotive trucks similar to those on electric locomotives. Each truck has a four wheel guiding truck and eight driving wheels, and the two trucks are long enough so they come together at the center and are flexibly joined by an articulated knuckle so the drawbar pull between them is transmitted directly rather than through the cab frame.

Two 1500 horsepower Diesel engines, together with the generators and control equipment, are contained in the one cab. This gives a shorter locomotive than was formerly necessary for the same horsepower. The larger number of axles allows less weight per axle, making the locomotive less subject to roadway restrictions and easier on the line. Drive is by eight motors, one on each driving axle. The pilot trucks and articulated chassis give the cab easier riding characteristics. Maximum speed is 120 miles an hour, but on the Seaboard, where the new locomotive will be used in fast freight service, it will be restricted to 85.

Fairbanks-Morse also announces a new and more powerful locomotive, an engine of Diesel switcher appearance, but powered with an F-M opposed piston Diesel so as to pack 2000 horsepower into the one small unit. It is offered as a transfer and light road locomotive.

Making the biggest dent so far in orders is a new type Diesel developed by Electro-Motive and sold first to the Pennsylvania as the order for 10 road Diesels announced last month in TRAINS. It is similar in appearance to the freight Diesel and also is usually made up in multiples of four units. But each unit packs 1500 horsepower instead of 1350 and the electrical control is so arranged that the locomotive can be used in either freight or passenger service.

This new Electro-Motive Diesel does not displace the 2000 horsepower passenger units or the 1350 horsepower freight units in the line, but it does make an addition which is mighty popular and useful judging from the many recent orders quoted in multiples of 1500 horsepower. Its design was made possible by new generating and control equipment which takes full advantage of the 1500 Diesel engine horsepower which always was available in the 1350 horsepower freight unit.

Locomotive Notes

The postwar Electro-Motive passenger Diesels are coming onto the rails with the same front end as the freight Diesels, a slightly stubbier nose than the prewar passenger Diesels. . . Riding the open highway from Schenectady to Binghamton offers a splendid chance to see big steam power of the Delaware & Hudson in action. Both 1500's of 4-6-6-4 wheel arrangement and 300's of 4-8-4 are in service here and if one is lucky he may see a train double headed by one of each. . . The Boston & Maine's *Alouette* (Boston-Montreal) is still being handled into Boston by a Canadian Pacific light Pacific. . . . To provide power for the new *Prospector* the Rio Grande uses half of a 5400 horsepower freight Diesel. The resulting two-unit

C. A. Brown, Box 128, Rutledge, Pa.

Here is the first of a new design of Baldwin road Diesel with 3000 horsepower built into a single unit. This one is going into fast fruit service on the Seaboard. Running gear arrangement is radically different from the usual two-trucked Diesel locomotive. This type has a running gear more like large electric locomotives, with guiding wheels and with drawbar pull carried through the trucks.

2700 horsepower locomotive is less powerful than most passenger Diesels, but the train runs only six or seven cars. . . . Diesels are carrying most of the load now along the Fitchburg Division main line of the Boston & Maine.

The Baltimore & Ohio has received seven additional 4000 horsepower Electro-Motive passenger Diesels which are used in through service. As a result older less powerful Diesels are released for New York-Washington trains, most of which are now Dieselized. . . . The Union Pacific has received the first Fairbanks-Morse road Diesel locomotive, a 6000 horsepower freight-passenger dual service unit which has been designed for a maximum speed of 65 miles an hour. It is being tested south of Salt Lake City on the run to Los Angeles. The UP is also getting from Electro-Motive a four-unit 6000 horsepower locomotive which will be tested between Green River, Wyo., and Ogden, Utah, in comparison with the *Big Boy* 4-8-8-4 steam locomotives, the most powerful steam locomotives in the world.

Odds and Ends

The C&EI has adopted the Mars safety light signal for the rear end of all mainline passenger trains. The light is an oscillating red searchlight, swinging in a figure 8, and goes on automatically with an emergency brake application. . . . The Central Electric Railfans' Association, 1240 Edison Bldg., Chicago 3, has issued a comprehensive and neatly printed bulletin, with many photographic illustrations and maps, on the Union Traction Company of Indiana. Single copies may be purchased for $1.

The Rock Island has started operation of its first postwar *Rocket* freight, a fast train on schedule as reliable as passenger between Chicago, Kansas City, Fort Worth and Houston. It is the first of a fleet that is planned. Diesel locomotives of 4050 horsepower are used. . . . Approval is expected soon of the ACL's proposal to acquire the Atlanta, Birmingham & Coast of which it already owns control. However Florida interests are opposing ACL's plan to take over the Florida East Coast as part of reorganization plans. . . . Old times are back again. For the Army-Navy football game in Philadelphia the Pennsylvania Railroad handled a most imposing array of special trains, including Congressional and Army & Navy Club trains from Washington, three trains of cadets direct from West Point, and numerous extras and sections for the public. Some trains from Baltimore and New York were made up entirely of multiple unit cars. Twelve extras were moved in through North Philadelphia in less than two hours, in addition to regular traffic at this busy spot, and six extras came in from Washington at 30th Street.

B&O Moves to NYC Station in Detroit

After finally obtaining I. C. C. approval for the change, the Baltimore & Ohio is moving its Detroit terminal on January 7 from the Fort Street Union Station to the Michigan Central (NYC) Station. At the same time it will begin operating over NYC instead of Pere Marquette tracks between Toledo and Detroit.

The new arrangement gives B&O a slightly shorter line into Detroit as well as improved station facilities. Its Washington trains had grown so long that they had to be set into Fort Street in two pieces and coupled up after they pulled out. At the Michigan Central Station tracks are longer, and double ended instead of stub. Furthermore Fort Street was a bad place from the competitive standpoint. Three Washington trains pulled out in 20 minutes, the Pennsylvania's *Red Arrow* at 5:20, B&O's *Ambassador* at 5:30, and C&O's *Sportsman* at 5:40, making a very crowded station during this brief period and causing some mixups of passengers.

B&O originally planned the move last June 7 when its contract with Pere Marquette expired. The move was opposed both by the Pere Marquette Brotherhood, because PM crews formerly handled the trains under an operating agreement, and by the Michigan Central Brotherhood because the new contract was for trackage rights under which B&O crews would work into Detroit. The I. C. C. examiner's report recommended refusing permission for the change, but when I. C. C. Division 4 heard the application it decided the B&O had not previously operated into Detroit, but had only participated in a joint traffic arrangement. Therefore the I. C. C. was without power to force the old arrangement to continue, and the Pere Marquette refused to extend the contract, perhaps because the C&O merger would put it directly into Washington. If the I. C. C. did not grant permission to use NYC trackage rights the B&O operation would end at Toledo, which would leave all employees worse off. The new agreement on the other hand benefited both B&O and NYC employees, and permission was granted.

A. C. Kalmbach.

Tennessee Central

Its main line is only 248 miles, but it does some real mountain railroading crossing the Cumberland range

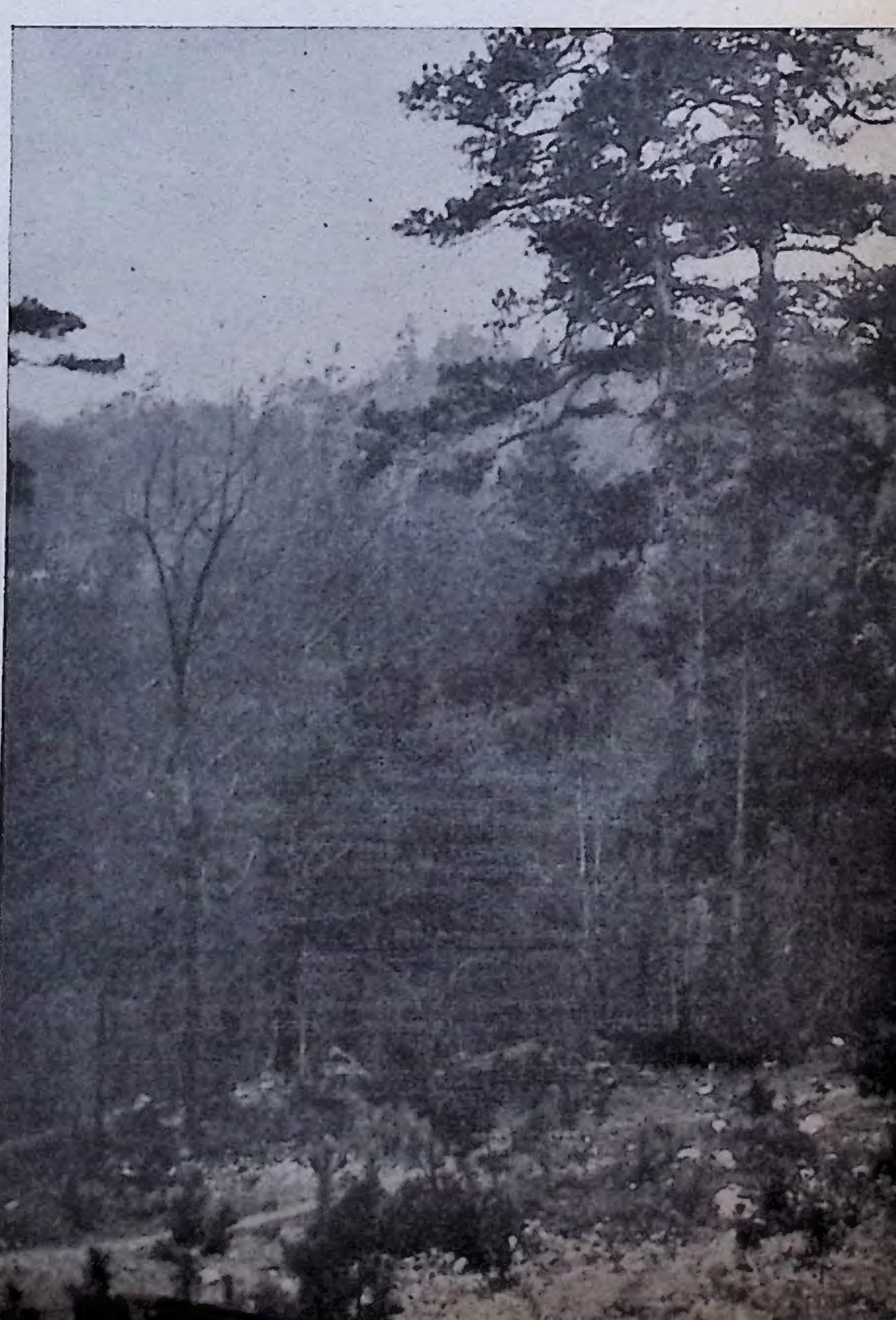
BY GEORGE W. HILTON
PHOTOS BY J. J. THOMPSON

The 248-mile main line of the Tennessee Central Railway is a small part of America's 230,000-mile total, but it is vastly important to the region it serves. It is important, too, to traffic strategists of the big Illinois Central and Southern systems. The Tennessee Central provides an invaluable connection, permitting them both to establish freight service into Nashville.

Between the IC connection in Hopkinsville, Ky., and the Southern interchange at Harriman, Tenn., lies as rugged a line as any east of Denver. For pure brutality of operating conditions, the Eastern Division (Nashville-Harriman) has an edge over the Western Division (Nashville - Hopkinsville). The Eastern Division crosses the back of the rugged Cumberland Mountains with a succession of curves, many as sharp as 10 degrees. Ruling grades of three per cent eastbound and 2.6 per cent westbound are maneuvered in moving tonnage from a low of 424 feet above sea level at Nashville to the summit of 2017 feet just east of Monterey.

On the Western Division few curves exceed four degrees and none are worse than six degrees. The ruling grades are 1.5 per cent westbound and 1.6 per cent eastbound.

Such conditions as these are reflected in severe limitations on freight tonnage. The heaviest train which could be handled unassisted



At Ozone, Tenn., the Central tracks are dropping downgrade toward the east into the valley of the Tennessee. At Harriman on the Emory River, just north of its junction with the Tennessee, the Central connects with the Southern main line and a branch which with Tennessee Central forms a through route Nashville to Knoxville.

from Nashville to Harriman by the Tennessee Central's most powerful Mallet locomotive would be only 950 tons. Westbound a Mallet could haul 1650 tons. These limitations are circumvented by doubleheading all eastbound tonnage freights from Carthage Junction to Monterey. This 47-mile stretch includes the sharpest curves and the stiffest grade, 3.0 per cent Silver Point Hill. To haul tonnage trains from Monterey to Emory Gap and Harriman, locomotives double Flat Rock Hill. Doubling a hill consists of cutting a train in two at the foot of the grade and moving it up one half at a time. Most railroads consider doubling an emergency expedient to use when heavy trains stall on grades. The Tennessee Central, however, makes it standard practice, finding it more economical and convenient than the use of helper engines.

Westbound freights are helped up 2.6 per cent Rockwood Hill by yard engines stationed at nearby Emory Gap, an interchange yard with the Southern Railway. Helper engines are cut off at Daysville. Trains proceed to Nashville unassisted but double Nigger Hill en route.

In this way freights of about 2000 tons can be operated in either direction. On the Western Division, where Mikado locomotives are used, somewhat shorter trains are run without doubling and without doubleheading.

Daily time freight service is offered over the entire main line. The Eastern Division time freight leaves Nashville at 9:30 p.m. and arrives in Emory Gap at 8:35 a.m. Westbound, it leaves Emory Gap at 9:15 a.m. and comes home in Nashville at 7:30 p.m. The Western Division time freight leaves Hopkinsville at noon and arrives in Nashville at 5:15 p.m. It begins its return at 5:45 p.m., arriving in Hopkinsville at 10:45 p.m. A way freight leaves Nashville on Mondays, Wednesdays and Fridays, returning

on Tuesdays, Thursdays, and Saturdays. Except for a six-day-a-week round trip from Nashville to the end of the Old Hickory Branch, all other freights run as extra movements.

Eastern Division freight trains operate under a 30-mile-an-hour speed limit. On the Western Division, the ceiling is 25 miles per hour from Nashville to Edgoten and 20 miles per hour the rest of the distance into Hopkinsville. Timetables, train orders, and manual block signals control the entire railroad.

The Tennessee Central is fortunate in having its two divisions produce almost equal amounts of interchange tonnage. In prewar 1940, interchange with the Illinois Central in Hopkinsville and the Louisville & Nashville in Clarksville accounted for 22,592 loaded cars. The Eastern Division interchanged 23,687 loads with the Southern Railway at Emory Gap and Harriman. In Nashville itself 19,606 loads were interchanged with the L&N and the Nashville, Chattanooga & St. Louis.

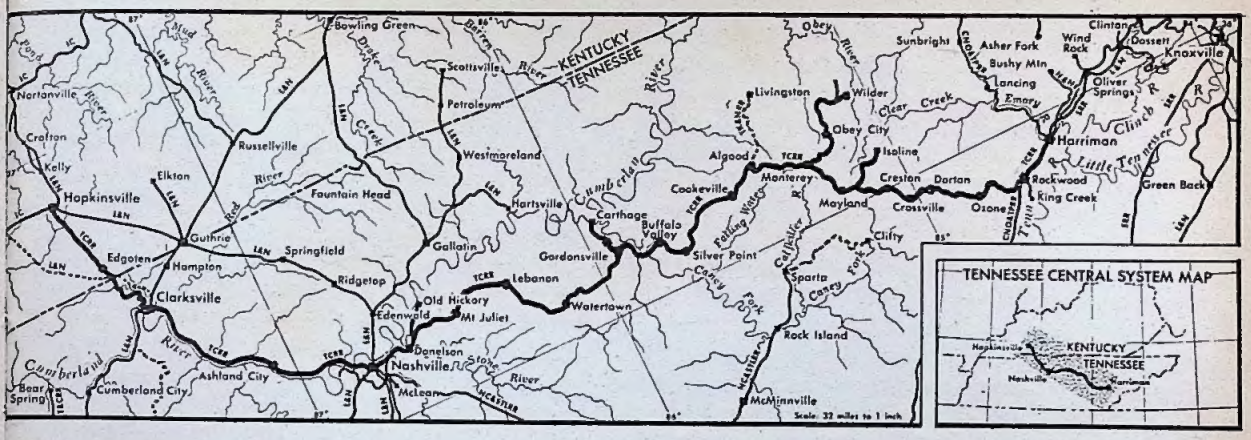
The Tennessee Central has superb coverage of the Nashville industrial district. Its Western Division leaves the main line at the east end of Nashville and circles three sides of the city before heading west. As Nashville grew in industrial importance, industries found this belt line the ideal location.

To the Tennessee Central, as to most medium sized roads, the growth of interchange traffic and the increased numbers of on-line factories have proved lifesavers. When the railroad was conceived in the 1880's, it was intended to haul coal from the fields near Monterey to the connection with the old Cincinnati Southern (now the CNO&TP line of the Southern Railway). When coal hauling proved not as profitable as anticipated, the road was pushed westward into Nashville in 1902 and extended into Hopkinsville in 1903.

Locomotives of the Tennessee Central

Number of engines	Numbers	Type	Cyl. diam. and stroke, in.	Steam pressure, lbs.	Grate area, sq. in.	Driver diam., in.	Weight on drivers, in.	Weight of engine, in.	Tractive effort, lbs.	Builder	Year built
1	50	B-B	12½x13	-	Diesel	40	201,400	201,400	65,670	Alco	1939
1	51	B-B	12½x13	-	Diesel	40	198,000	198,000	59,400	Alco	1941
2	333-334	2-8-0	20x26	185	32.8	51	144,500	163,000	32,100	Alco	1914
4	502-506	4-6-0	21x26	180	32.1	63	126,500	172,500	27,800	Alco	1903
4	551-554	4-8-2	24x28	213	59.95	63	180,500	273,000	46,300	Alco	1926
8	601-608	2-8-2	22x28	200	47.8	57	158,000	208,000	40,400	Alco	1922
2	701,703	2-8-2	25x30	200	66.8	57	224,200	287,700	55,900	Alco	1924
2	702,704	2-8-2	25x30	200	66.8	57	234,000	296,400	55,900	Alco	1924
3	725-727	2-8-2	25x32	180	56.5	63	220,780	295,800	48,600	Alco	1913
1	728	2-8-2	25x32	180	56.5	63	223,320	287,500	48,600	Alco	1914
1	729	2-8-2	25x32	180	56.5	63	217,200	285,800	48,600	Alco	1914
1	730	2-8-2	25x32	180	56.5	63	217,200	285,800	48,600	Alco	1914
1	2062	4-6-2	25x26	215	50.8	63	156,700	248,733	48,683	Alco	1906
1	2064	4-6-2	25x26	215	50.8	63	156,700	248,733	48,683	Alco	1907
1	2065	4-6-2	25x26	215	50.8	63	156,700	248,733	48,683	Alco	1913
1	1341	2-6-6-2	22&35x32	225	72.2	57	354,500	427,000	75,830	Alco	1913
1	1385	2-6-6-2	22&35x32	225	72.2	57	354,500	427,000	75,830	BLW	1914
1	1390	2-6-6-2	22&35x32	225	72.2	57	354,400	427,000	75,830	BLW	1914
1	1396	2-6-6-2	22&35x32	225	72.2	57	354,400	427,000	75,830	BLW	1914

35 Steam Locomotives
2 Diesel-Electric



Tennessee Central connects the Illinois Central at Hopkinsville and the Southern at Harriman with Nashville.

Connecting Nashville with the Illinois Central on the west and the Southern on the east, it was well braced for the eventual decline in revenues from coal originations. Once 50 per cent of all originated traffic consisted of bituminous coal. The decline has been rapid and drastic. Today considerably more coal is received from connections than originated. Actually, 75 per cent of all traffic is now received from connections.

The decline in originated coal traffic has been more than offset by the tremendous wartime increase in other traffic. Interchange jumped 50 per cent between 1940 and 1944. Gross freight receipts at Nashville rose from $3,325,000 to $3,570,000. The Old Hickory Branch reflected increased activity in its big Du Pont rayon plant. The other two branches also remained profitable lines.

Richest traffic plum of all is Edgoten, Ky. Hardly important enough for an agency in 1940, Edgoten became a traffic gold mine in 1942 when the United States Army built Camp Campbell there. The Tennessee Central is the camp's only railroad connection. Over the Central's rails moved enough men and supplies to make the operating department think that the whole U. S. Army had located there together with most of its allies. Edgoten, which in 1940 produced no revenue whatsoever, in 1944 turned in nearly $3,304,000 of gross freight receipts.

The railroad has been able to handle the great traffic increases largely because of the extensive physical improvements it has made during the last several years. The entire main line has been ballasted with crushed stone. Standard rail on the Eastern Division is new 100 pound controlled cooled rail laid on red or white oak treated ties protected by tieplates. Ninety pound rail removed from the Eastern Division is relaid on the Western Division. Many guard rails, gauge rods, and trackside flange oilers have been installed on all curves sharper than six degrees. Bridges have been strengthened to support heavier motive power and tunnel floors have been lowered to allow greater freight clearances. Newly-acquired, heavier locomotives have meant longer trains, which in turn have necessitated longer sidings.

Outstanding in the improvement program has been the enlarging of the motive power roster by the purchase of powerful road engines from other railroads. The Tennessee Central recently joined the Santa Fe, Pennsylvania, and Rio Grande in using ex-Norfolk & Western locomotives and bought four 2-6-6-2 Mallets. These engines, Nos. 1341, 1385, 1390, and 1396, were part of the N&W's large collection of Z-1a class freight haulers. No. 1341 was built by Alco (Richmond) in 1913, the rest by Baldwin in 1914. Equipped with the N&W's valve permitting a shift between simple and compound operation while running, they top the Tennessee Central roster in tractive effort with 73,830 pounds compound and 90,996 pounds simple. They are used in road freight and helper service on the Eastern Division and frequently in switching and transfer duty on the Nashville belt.

Locomotives 725 to 730 were built in 1913 and 1914 by Alco (Dunkirk) for the New York Central Railroad. They are medium-sized Mikados with 48,500 pounds of tractive effort. The New York Central completely modernized these

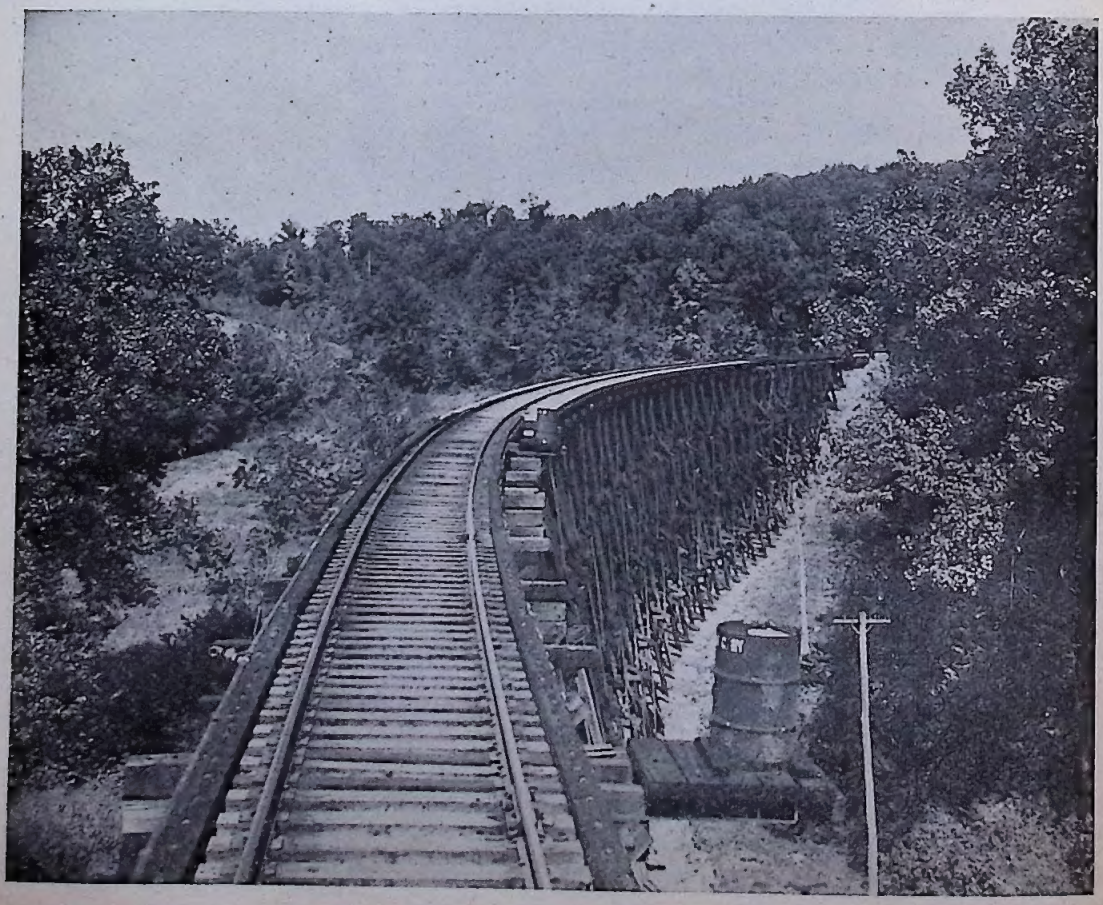
locomotives with stokers, power reverse gears, low water alarms, steam heat, chassis lubricators, and automatic bell ringers. Nos. 725 through 729 are customarily used as freight power on the Eastern Division. They are also useful in passenger service, especially on extra movements. The 730 is currently used as a yard engine at Nashville.

The three Pacifics are the most unusual locomotives on the Tennessee Central and some of the most distinctively different engines in existence. Alco (Richmond) built them in 1906, 1907 and 1913 as passenger engines for the Illinois Central. When light Pacifics were no longer suitable for IC passenger service, the Paducah Shops rebuilt them with 61-inch drivers and sent them out as branch line freight engines. Originally numbered 1040, 1048, and 1124, they came from the shops renumbered 2062, 2064, and 2065. Like the N&W Mallets they retained their numbers upon coming to the Tennessee Central. They are remarkably versatile. The 2064 is at present at work as a yard engine at Nashville while 2062 and 2065 haul mainline freight and occasionally take a turn in passenger service when one of the 4-8-2's is not in action. They have 48,000 pounds of tractive effort and a factor of adhesion of only 3.2, one of the lowest in America.

The other locomotives were built originally for the railroad. The most powerful are the heavy Mikados, 701-704, used in freight service on the Nashville belt and on the Eastern Division. Weight limitations keep them, as well as the Mallets and the 725 class Mikados, from operating west of the belt line on the Western Division.

Light Mikados 601 to 608 haul freight all over the railroad, including the branch lines. Ten-Wheelers 502-506 are largely relegated to the branches; 333 and 334, the only two Consolida-

Tennessee is not flat country, east or west. These timber trestles on the TC's Western Division are part of the inevitable heavy maintenance expense for a heavy railroad located through this kind of terrain.



tions which have evaded the Tennessee Central scrap heap, are used as yard engines.

Switching service at Nashville is performed primarily by locomotives 50 and 51, Alco-GE 660 horsepower switchers. They turn in creditable round-the-clock performance on the Nashville belt line.

Regular passenger assignments generally devolve upon the four Mountain type locomotives Nos. 551 to 554, built by Alco in 1926. They are the most modern steam locomotives on the railroad. Their tractive effort is 46,300 and their drivers are 63 inches. These locomotives are very capable of maintaining their schedules over the difficult Eastern Division with the customary four, five, and six car trains under the passenger speed limit of 40 miles per hour.

Because the Tennessee Central forms part of the only direct route from Nashville to Knoxville and points east, it maintains a higher standard of passenger service than most comparable railroads. It operates both a day and a night train in each direction between Nashville and Harriman. Both trains make close connections with the Southern Railway for Knoxville, and the night train carries a through Pullman. Usual consist of the day trains is a 551 class locomotive, a railway mail car built new for the Tennessee Central, an ex-Pittsburg & West Virginia baggage and express car, a partitioned coach of Tennessee Central design, and a straight coach converted from a Pullman parlor car. All these cars are steel. Extra coaches are added on weekends. The night trains are identical with the addition of the single Nashville-Knoxville Pullman on the rear end.

Twenty-two cars are currently available for regular and extra passenger service. There are six converted parlor cars, six partitioned coaches, four mail cars, and five baggage-express cars. The railroad also owns one highly original diner for use in troop trains. It is a former United States Department of Commerce car, re-equipped in Nashville Shops with a U-shaped counter and 62 seats. No scheduled passenger

In the beautiful valley southeast of Harriman, Tenn., east end of the Central, the line parallels the main New Orleans-Cincinnati line of the Southern through Emory Gap, and near Harriman crosses it on this overpass bridge. The Tennessee Central, together with the Southern connections at Harriman, forms part of Nashville's only direct route east, and in spite of the short run, the usual day train, below, consists of a Mountain type locomotive, a railway postoffice car, baggage car, partitioned coach, and a full length coach.

trains now operate on the Western Division. For many years two trains a day ran between Nashville and Hopkinsville. This service was reduced to one a day, and in 1930, was discontinued entirely.

To the Tennessee Central, the passenger service of the

past is less important than the freight service of the future. This road, at present in the best physical condition in its history, intends to continue its improvement policy to facilitate handling continual increases in through and local freight traffic.

Watertown, Tenn., is a typical small station on the Tennessee Central. The town has a population of 908, and aside from the usual general stores, farm stores, and services, it is the home of a hosiery mill, a shirt factory, and a planing mill. The freight train below is the local from Hopkinsville, west end of the line, pulling into the yard at Nashville. Track scene at center below is typical of the Western Division, which leaves Nashville at the east end of the city and then circles the outskirts, forming a useful belt line.

In the Canyon of the Sacramento

Up 40 miles of twisting canyon track above Shasta Dam the SP climbs into shadow of Mount Shasta

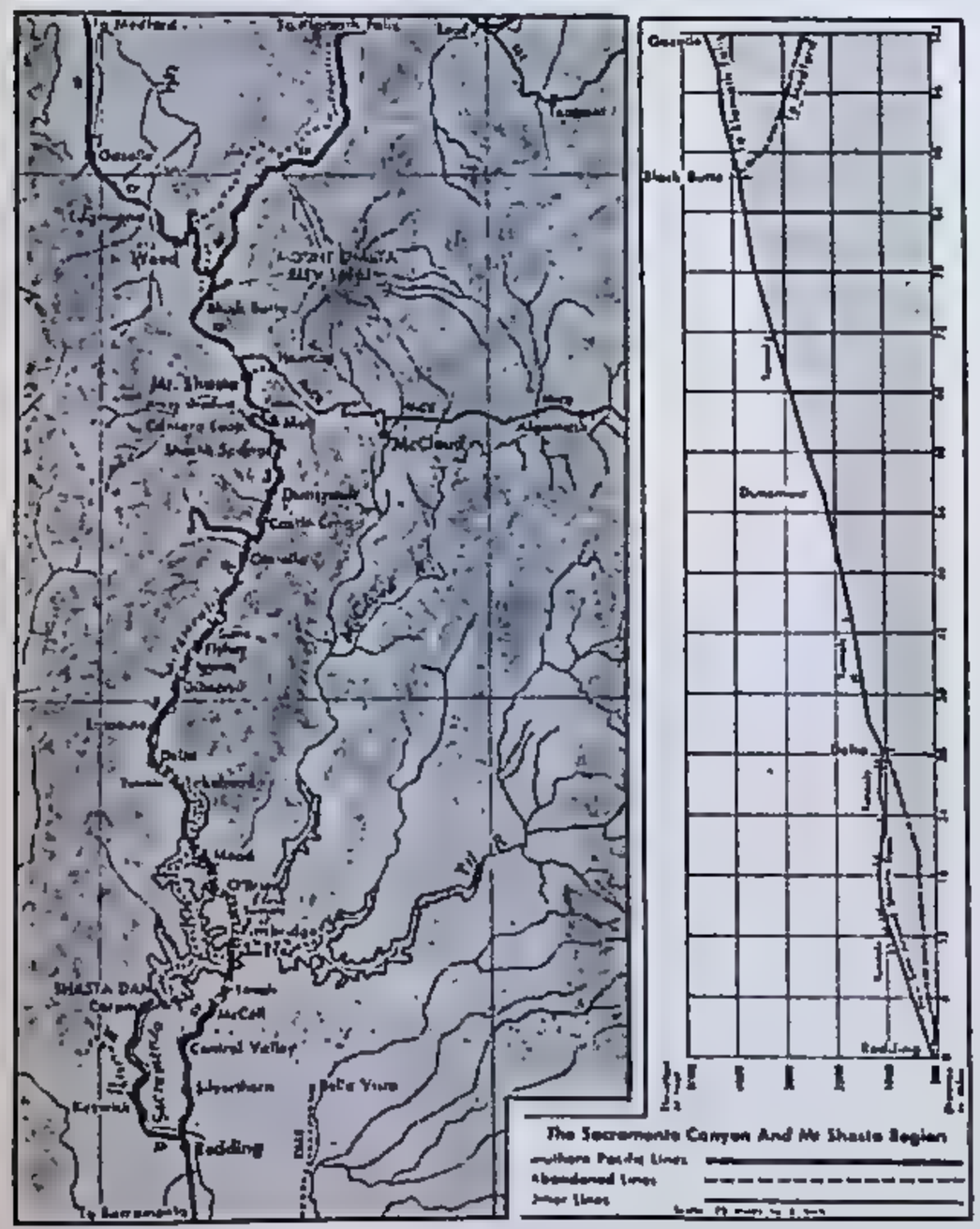
PHOTO STORY BY PHILLIP C. JOHNSON

One of the most spectacular portions of the Southern Pacific's Shasta Route is the tortuous stretch through the deep rugged canyon which husbands the turbulent headwaters of the Sacramento River. This canyon was 70 miles long, from the base of 14,300-foot Mount Shasta south to Redding, but the southern 30 miles are now being filled by the reservoir of Shasta Dam. The railroad has been relocated around this reservoir, but the 40 miles from Delta north through Dunsmuir to the town of Mount Shasta still furnish some of the most difficult operation of the entire Shasta Route.

All rail passenger traffic and the bulk of the freight between California and the Pacific Northwest is siphoned through the canyon's single C. T. C. operated track, track which is an amazing succession of bridges, tunnels, terrific grades and curves which include some of the sharpest on the entire Southern Pacific system. North from Dunsmuir the line begins its climb out of the canyon, gaining most of the elevation by means of a hairpin loop in a box canyon at Cantara. This is the steepest portion of the canyon line, with 1263 feet of rise in 15 miles.

Dusmuir is the division headquarters, and with the junction of the Siskiyou and Cascade lines only a few miles north at Black Butte, Dunsmuir yard is busy. The town is located in the bottom of the canyon with towering moun-

Until recent years trains stopped momentarily at historic Shasta Springs while passengers sipped the cold carbonated waters which are still shipped out in tank cars. Pavilion to right houses funicular railway's lower terminal.



Cantara Loop is the sharpest mainline curve on Southern Pacific, 14 degrees on 2.2 per cent grade compensated. By this hairpin loop and another not-quite-closed loop four miles away trains drop from the upper plateaus of Mount Shasta down into the Sacramento River Canyon. In the map dotted line through lake is old main line which was abandoned after the building of Shasta Dam.

tain walls on each side, and a long narrow terminal layout was necessary. The yard is a mile south of the town, and is long and narrow with a grade against northbound traffic. Considerable ingenuity was necessary to work the shops and enginehouse into the space along the river bank near the passenger station.

The Portland-bound traveler finds the canyon's sparkling clear mountain streams, thickly forested slopes and gushing mineral springs a welcome relief after passing through nearly 200 miles of the broad Sacramento Valley's simmering summer heat. The rail-fan who can afford to spend a day or more in the canyon will marvel at the matter-of-fact manner in which such heavy passenger trains as the *Cascade, Beaver, Oregonian, Klamath,* and *West Coast* regularly negotiate this difficult stretch without interupting the heavy movement of freight and helper engines. All about is evidence of constant maintenance and eternal vigilance.

Helpers are used on northbound trains on both sides of Dunsmuir. Manifest trains

It takes power to move a train over the Shasta Division. Three 2-10-2 type pushers together in a freight train is a not unusual sight. The group at left is working hard to help move 40 cars up the slightly more than three per cent grade from Ashland, Ore., to Siskiyou Summit on the Siskiyou line not far northwest of the Sacramento Canyon. About one third of the traffic in the Sacramento Canyon originates from the movement of helper engines like the 3767, right, which is returning to Dunsmuir after furnishing helper service up to Black Butte. Scene is near Mossbrae Falls and is typical of the rugged grandeur of the canyon.

northbound out of this town average four or five locomotives apiece. The limit for one of the cab-ahead articulated locomotives which are standard on this division is 1550 tons north from Dunsmuir to Black Butte, so to maintain the standard train loads of from 4000 to 5000 tons, 2-10-2 type helpers are added in sufficient number. Some idea of the mechanical problems involved in these mountain operations may be gained from the fact that, because of excessive braking and flange wear on curves, a 2-10-2 helper must get a new set of No. 1 driving tires every six weeks. All locomotives on this division burn oil, which is hauled to Dunsmuir in tank cars. Trains up the canyon are often filled out to tonnage limit with company fuel tank cars, so as to avoid any waste of tractive effort. Retainers are used on the brakes of downgrade trains to hold them to the authorized freight speed limit of 20 miles an hour.

First 628, engine 4216, a cab-ahead 4-8-8-2, blasts its way up the canyon north of Dunsmuir, filling a rainy morning with loud exhaust, and ably abetted by 4-8-8-4 and 2-10-2 helpers some 80 cars to the rear. Judging by the congregation in the 4216's cab, the front end of an articulated is a very desirable place on a cold wet morning. Notice train number indicators, typical of SP.

Stately Mount Shasta dominates the line in the upper portions of the Sacramento Canyon as well as farther north where the Cascade line seems to almost circle the shoulders of the mountain and the Siskiyou line junction at Black Butte is only about eight miles from the mountain's peak.

Altoona Works

At Altoona, Pa., near Horseshoe Curve, the Pennsylvania Railroad maintains world's most extensive group of railroad shops

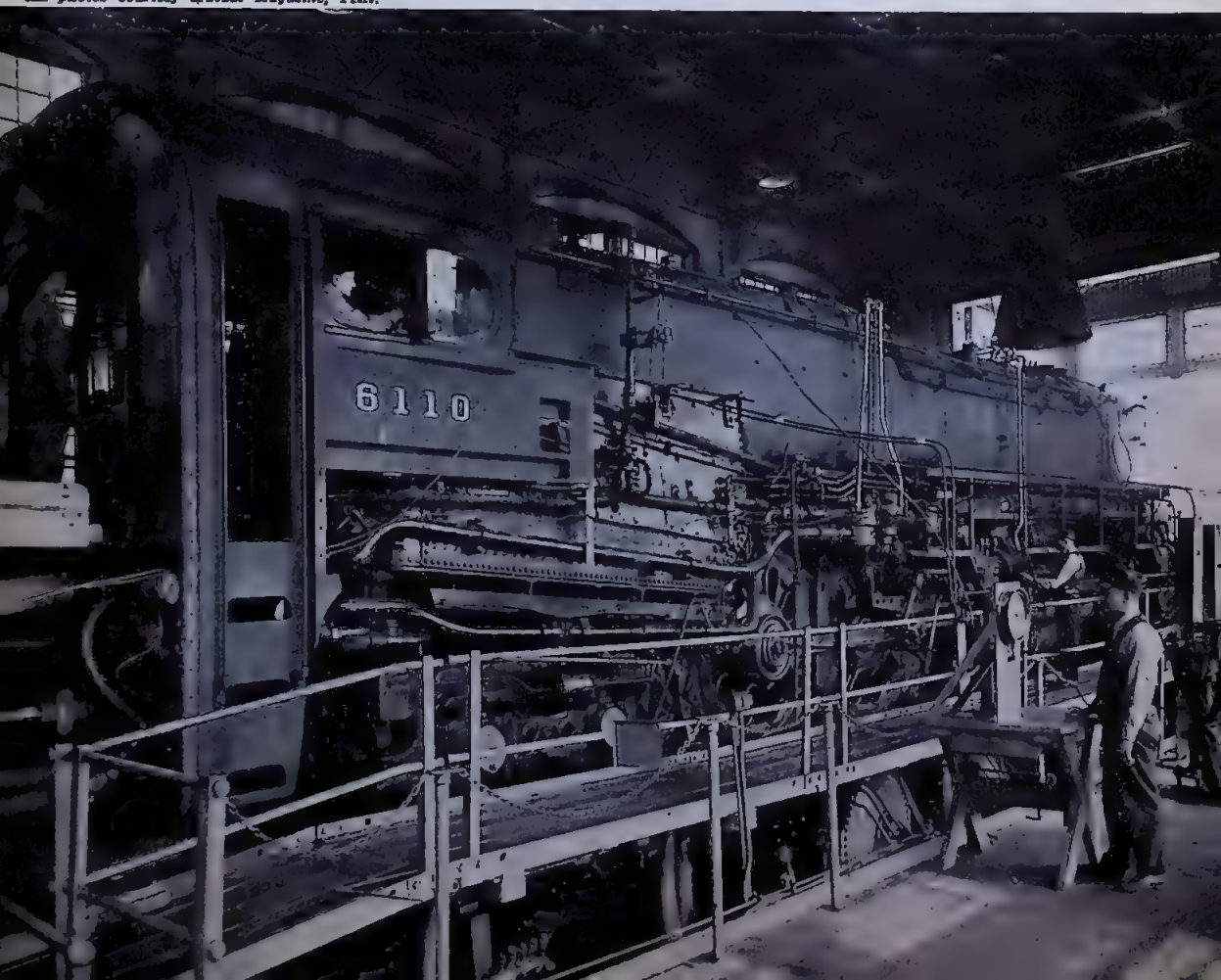
BY TOM HANNA

There is a standing pleasantry that anything from a collar button to a battleship can be built at Altoona Works, the main Pennsylvania Railroad repair and building center, which comprises the largest and most extensive group of railroad shops in existence. Although it is not officially known whether or not some machinist, needing a collar button, turned one out from a piece of scrap, the men of the shops admit that the business of building a battleship is stretching things a little too far—but only a little.

A standard description of Altoona Works is that it is devoted primarily to the building and maintenance of locomotives and cars and the production of parts required in, and peculiar to, such equipment. That standard description covers a lot of territory. So, for that matter, does Altoona Works.

The shop yards at Altoona, Pa., stretch over an area of some 218 acres and the shop buildings contain more than 65 acres of floor space. Placed end to end, the buildings and yards

All photos courtesy *Mutual Magazine*, PRR.



would extend more than three miles. Altoona Works is the city of Altoona's major industry and the city's greatest reason for existence. It plays a similar role for the neighboring and smaller towns in Blair County.

Located a little east of the Pennsylvania Railroad's main east-west line, the Works is strategically placed so that it can service and supply divisions in any direction. The line westward goes to Pittsburgh, Columbus, Indianapolis and St. Louis. From Pittsburgh it branches north to Chicago, Detroit, Cleveland, Buffalo and other Great Lakes ports. To the east, the works can service the more highly concentrated traffic sections of the railroad leading to New York, Philadelphia, Washington and Baltimore.

Not considered part of the Works, but located in Altoona and working in close conjunction with the Works, are the facilities of the Pennsylvania Railroad's Test Department. The department is equipped with laboratories and machines which can furnish an accurate analysis of anything from the basic components of a cotter pin to the performance of a locomotive, both as a whole and in its individual parts.

In testing a locomotive, the department mounts the mammoth of the rails on special wheels which are equipped with extended axles fitted with absorption brakes. The brakes can be adjusted to furnish any desired resistance and thus simulate any condition currently met by the locomotive in active service. It is one of the very few machines of its kind in the world and is an improved version of the original testing apparatus first exhibited by the Pennsylvania Railroad at the St. Louis Exposition in 1904.

To return to Altoona Works proper—the buildings house every conceivable type of equipment. Almost 5000 machine tools are in continuous three-shift operation, nearly 100 overhead cranes do the heavy lifting and numerous power and jib cranes handle the lighter material.

Everything in rolling stock repair and maintenance is done at the Works from the construction of new locomotives to the mixing of hard and soft greases for use over the Pennsylvania System. There is noisy, blustering activity in the blacksmith and boiler shops and tranquil quiet in the upholstery shop, where carpets and seat coverings are stitched. There are heavy, rough and formidable operations and light, neat, precise ones. Even the paint used on locomotives is mixed at Altoona Works.

Some small idea of the magnitude of Altoona Works might be gleaned from the fact that one month's supply of piecework pay slips would make a stack approximately 35 feet high if placed one atop the other.

Three main groupings of shops make up the Works. There are Juniata shops, composed of blacksmith, machine, boiler and locomotive repair shops; the South Altoona foundries, which also include brass finishing and automatic spring shops, and the Altoona car shops, which are devoted to the construction and repair of both freight and passenger cars. There are no hard and fast regulations to these classifications. The shops flow into one another and work started in one section often is finished in another.

For instance, at the present time the Altoona Works is progressing the new 100-mile-an-hour Pennsylvania T-1 type locomotive which, complete with tender, will occupy 107 feet of track and weigh more than a million pounds. The main construction on these is done at Juniata, the tenders and cabs are built at the car shops and the streamlining of aluminum sheathing is made at the car shops and applied at the locomotive finishing shops.

In all, some 12,000 persons are employed at the Works, including many women who are working as industrial truck drivers, machinists, machinist helpers, boilermaker helpers and cleaners along with the usual complement of their sex in the office forces.

The Works management takes special pride in two of the specialties at Altoona: salvage work and welding. The Pennsylvania Railroad was one of the pioneers in structural welding, including the production of what are now called fabricated details replacing castings. In the comparatively new all-welding shop at Juniata, welding is employed for much of the restorative work on various parts which have been worn down through constant usage. With build-up welding processes, many items including piston heads, radius rods and lever connectors are restored to standard size, machined and placed in use again.

Welding has also replaced riveting in much of the finishing work on locomotives, tenders and cars, both freight and passenger. The new tenders present a gleaming, rivet free surface to the

One of the class T-1 fast passenger locomotives on the locomotive test plant ready to start a test. A locomotive can run 100 miles an hour or more while standing still where test readings can be more accurately obtained.

Back in Civil War days this photograph of Altoona Works was taken. It was then known as Altoona Shops. The railroad was only 15 years old at the time. This reproduction is from the original in the American Museum of Photography.

Altoona nestles in a valley not far below Horseshoe Curve, by which the Pennsylvania is enabled to scale the east wall of the Alleghenies with a maximum grade of only 92 feet to the mile. The left side of the curve in the photo is the low one, and the line follows the slope from there down into Altoona in the background. The other air views are a general photo indicating the size of the works and a closeup of the car shops section.

outside world. Just another welding item: Many truck frames, which otherwise would be scrapped, are restored by welding.

The salvage program, although instituted at the Works before the war, more than proved its worth in the face of wartime material shortages. With the approval of Federal agencies, a large freight car shop in the Altoona car shop section of the Works was finished last fall to facilitate car repair operations. The shop, erected over a progressive runway system used in repairing freight cars, was constructed almost wholly from structural steel salvaged from a formerly used 24-stall roundhouse.

The above, of course, is an outstanding example. But the small, day after day salvage activities effect a considerable saving in both money and materials. Old and worn axles, to mention but one item, are reforged into locomotive and car parts. When locomotives are stripped down for repairs, the iron firebox stay and crown bolts are cut out and melted for bloom iron. Worn and corroded ends of flues and superheater units are cut off, new ends are welded on and they are reshaped and reinstalled in locomotives. The modern brass foundry at the Works is equipped with the latest scrap handling devices, along with sand conditioning equipment, conveyors and electric furnaces. The electric furnace installation here is one of the largest in the world for melting non-ferrous metals.

Modern assembly line technique is used in the repair section of the car shops. Three tracks run the length of the main building. Two of the tracks are utilized for car repair work while the third is used to keep readily accessible repair material near at hand. As worn cars come in one end of the shop, they are stripped. Repairs are made as the cars roll along and they go out the other end ready for the road. Here too, new ways and means of restyling freight cars have been successfully applied in developing types of cars adapted to moving articles of tremendous sizes and enormous weights, such as machinery, generators and structural steel.

All the romance of the village smithy is magnified a thousandfold in the various blacksmith shops throughout the Works. There are forges

To Pittsburgh
To Philadelphia

The travograph machine, above, is a multiple cutting torch controlled by a pantograph mounting in such a way that all the torches follow a pattern piece and cut identical car or locomotive parts out of heavy steel plate. It is just one of many modern special machines used at Altoona Works.

A gondola nears completion in the car shops. The ends and sides, previously fabricated, are assembled under overhead cranes. Welding is widely used in the shops to build up worn materials and for fabricating of complicated parts, such as locomotive cylinders, which were formerly cast.

and furnaces of all sizes, ranging from a small rivet-heating type to a huge heat treating furnace that will hold a carload of wheels, figuring 96 to a carload, at one time. There are various sized forging hammers, ranging from those using three men—or in some cases two men and a woman—to those with six men in the crew. A story is told about one old-timer at Altoona who became so proficient with his steam operated hammer that he could place a watch on the block, start the hammer downward with 100-ton force and then stop it after the crystal of the watch had been broken, leaving the rest of the watch unmarred.

The steel shop, approximately 184 by 553 feet, is equipped with presses that range in capacity up to 2100 tons for fabricating steel shapes and parts required in the repair and construction of new cars and locomotive tenders. There is a tank—or tender—shop where tenders are repaired and new tenders built. An old roundhouse, formerly used to build freight cars, which was outmoded when Altoona Works grew to its present size, is now used as a paint shop for this equipment.

Little need be said about the various machine shops which are scattered throughout the Works. Equipped with the latest tools and machines, they can turn out anything from a small bolt to a huge driving wheel. The Works has its own power plant which furnishes most of the power needed to operate the various machines. It also has its own water supply system with seven reservoirs of 800,000,000 gallon storage capacity, using 54 miles of main distributing pipes throughout the Works and local engine houses. The daily water consumption, for both drinking and industrial purposes, ranges between seven and eight million gallons.

Another massive operation is carried on by the stores department which keeps more than 80,000 items in its everyday inventory. The Works also has four cafeterias, one at each of the main units, which cater exclusively to employees of the Works.

One of the largest shops is the huge erecting and machine shop, better known as the E & M shop, in the Juniata section of the Works. Here more than 2500 persons are employed on the three shifts. The E & M shop is devoted exclusively to the repair and building of locomotives. Here orderly progress is the keynote. Each locomotive is run onto an outside stripping track where the tank is uncoupled and sent to the tank shop for its overhauling. The cab is removed, burned out firebrick is knocked out and the stoker parts are removed. Anything needing attention is then sent to central repair shops. What is left of the locomotive is shunted into the E & M shop for final removal of its

parts and the installation of new or rebuilt parts.

In the E & M shop, locomotives may always be seen in some stages of temporary disarray. Space and facilities there permit the simultaneous repairing or building of 50 locomotives, steam or electric. When repairs are completed in the E & M shop, the locomotives are taken to the finishing shop as dead engines.

The finishing shop is just what its name implies. Here all final work is done on locomotives, seats are installed in cabs and a fire is started in the firebox. After a thorough check of all steam, water and air lines, the locomotive is given a final road test before being released from the Works.

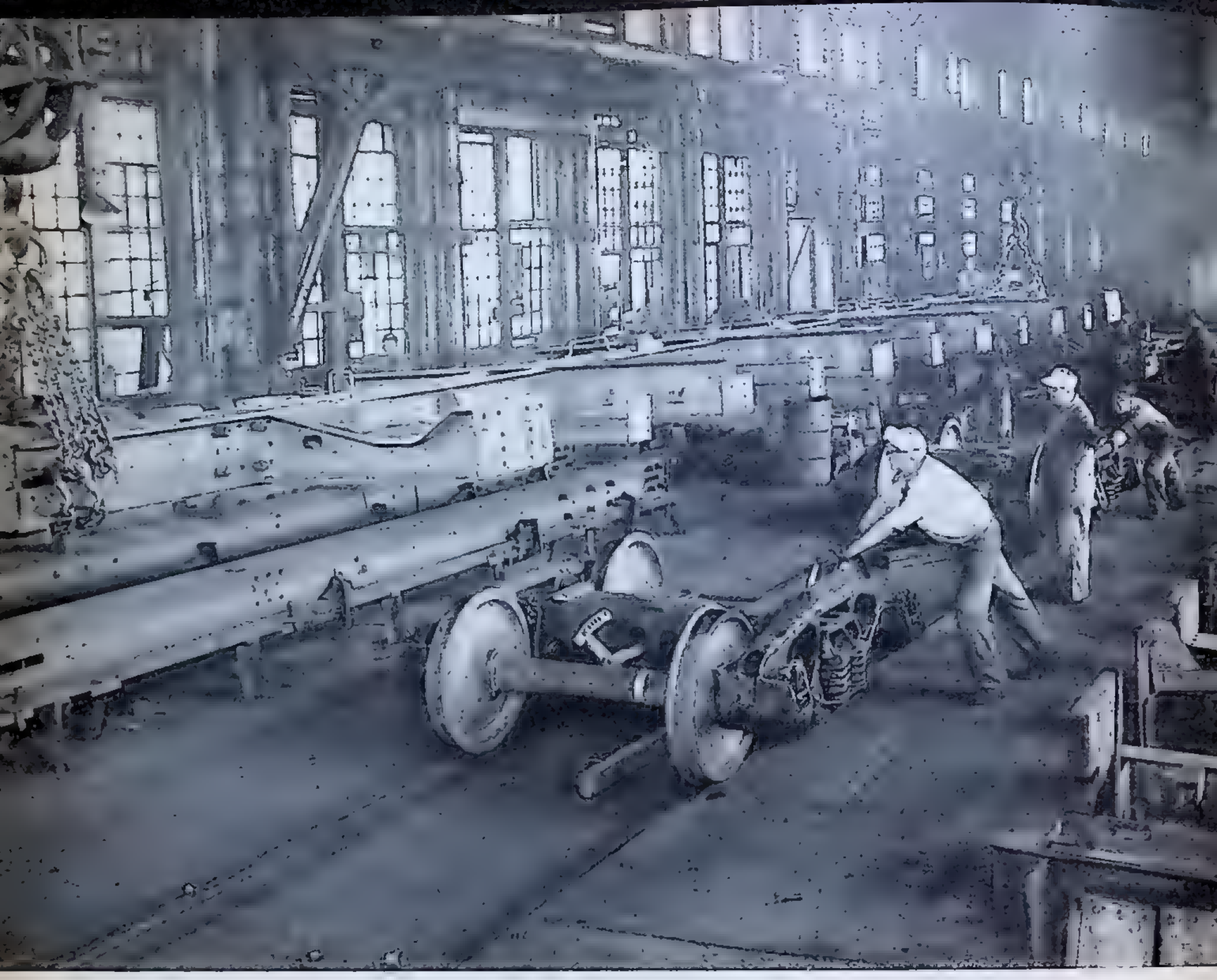
Another shop not heretofore mentioned is the scale shop where track scales are built and repairs to scales are handled for the Pennsylvania System. Innumerable locomotive and car castings are produced in the iron and brass foundries, located in the South Altoona section of the Works. Also in this section is the pattern shop, where, among many other things, may be seen the large firebox and boiler sheet patterns for the new locomotives. The oil mixing plant is located nearby with its many barrels of grease standing around for seasoning, one of the peculiarities of tallows. Also in the South Altoona group is the major electric power plant for the Works as well as the manufacturing laboratory for compounding black paint, disinfectant, grease compound, boiler compound and innumerable kindred articles.

There are numerous other shops which go to fill the entire roster at Altoona Works. There is an air brake shop, tin shops, a spring shop, engineering and drafting offices, erecting shops, a truck and wheel shop and process shops.

Throughout the war, and still in force at the present time, are rigid security regulations. Each workman must wear a badge containing his picture and pass through patrolman-guarded gates going to and from his place of employment. Smoking is restricted to certain places throughout the Works.

Strict safety rules are also enforced. Every workman is issued goggles that must be worn at all times. Visitors and officials going through the shops are also supplied with goggles. The safety issue stretches over and beyond the workman and is carried on to the ultimate passenger in Pennsylvania Railroad trains. All materials used at Altoona Works, either for repairs or rebuilding of old equipment or the construction of new rolling stock, are rigidly inspected through the elaborate testing facilities of the nearby Test Department.

Because of its extensiveness, the Works—aside from its railroad duties—plays an impor-



Freight cars are put together on a regular assembly line. Here is the beginning. The main frame for a gondola car has been put together upon a fixture, made up of long steel girders fitted with stops against which the various parts of the frame are located. When finished it is hoisted off the fixture, put on trucks, and started down the line.

tant part in Altoona and Blair County civic affairs. Recently the men at the Works, under the leadership of F. G. Grimshaw, Works manager, staged an impressive tribute celebration to all Blair County veterans of World War II. Particularly honored was a furloughed employee of the Altoona Works tin shop, Staff Sergeant Robert E. Laws, who received the Congressional Medal of Honor from President Truman for his work in wiping out a Japanese pillbox and rifle positions in a one-man attack which ended with Sgt. Laws attacking and besting armed Jap riflemen with his bare hands.

Like the Works and everything about it, the tribute celebration was done on a large scale. Many elaborate floats were constructed, 21 bands were secured, and approximately 12,000 employees of the Works, servicemen and women, and veteran organizations took part in an impressive three-hour parade which ended in a special program at the Altoona Cricket Field.

The City of Altoona, in turn, cooperates with the Works in—to mention but one example—offering special trade courses through the Altoona High School vocational department. Some of the classes include sheet metal drafting, woodwork, mechanical drafting and blueprint reading, machine shop, electric shop and electric and acetylene welding courses which are open to adults and are, in some cases, taught by experts from Altoona Works.

The Altoona *Mirror*, one of the city's independent newspapers, in speaking of the efforts of the men at Altoona Works, remarked editorially:

"Never tell the railroaders here that something can't be done. That's when they work the harder. . . . Our railroaders have brought a fighter's determination to their jobs and their skill, ability and ingenuity hastened the end of the conflict."

That is the Works—Altoona Works.

Arthur Lloyd, 1806 Silverado Trail, Napa, Calif.

Outlet Creek Trestle

The Northwestern Pacific runs through a beautifully wild and rugged country north of San Francisco. This is a freight extra with SP power, at Outlet Creek, north of Willits.

Kenneth Harris, U. S. C. G.

The Esquimalt & Nanaimo Railway

Northbound No. 1 of the Esquimalt & Nanaimo Railway, subsidiary of the Canadian Pacific, obligingly poses for the photographer halfway up the 2.2 per cent Malahat grade about 11 miles north of its southern terminus, Victoria, B. C. The line runs from Victoria, capitol city of the province, a distance of 140 miles north to Courtney along the east coast of Vancouver Island, and is one of the CPR's most profitable branch line operations, moving a lot of logs, timber and coal. All the E&N equipment is second-hand from the CPR's mainland lines, and many of the steel bridges, including the one in the background, were once in mainland service elsewhere. The line's most notable feature is the 1200-foot climb over the precipitous Malahat Mountains which fence Victoria off from the rest of the island.

Boston, Revere Beach & Lynn

Three-foot gauge suburban road, electrified during its last 12 years, prospered with excursion traffic

BY TRAINS STAFF*

Don't miss the great wreck! See two locomotives come at full speed and crash into each other!" read the notices which the Boston, Revere Beach & Lynn Railroad posted on every billboard of Greater Boston in the hot summer of 1904. What could compete with Revere Beach on a July holiday? A trip across Boston harbor on a red ferry shining with brass, a journey along the sparkling Atlantic on the narrow gauge excursion train, a grandstand seat where seabreezes ruffled the ladies' streamers, and a train wreck—all for 35 cents.

A crowd of 182,000 anxious spectators was gathered at the grandstands that day to see the railroad scrap locomotives discarded by the Boston & Maine. The mayor delivered a stirring address on Progress and Freedom. Then Superintendent Fenno stepped up to the track and ceremoniously fired his revolver. The locomotives chug-

* From material furnished by W. H. Butler Jr., and H. S. Walker.

Other evidence besides the shorter skirts in scene at right shows that some time has passed between the taking of these two pictures. Crescent Beach station saw excursion crowds for many years. When the road was electrified in 1928, turnstiles were installed to the left of the station. The original Cresecnt Beach station, built nearer the ocean, was a combination station and hotel called the Pavillion.

H. S. Walker, Railway & Locomotive Historical Society, Boston, Mass.

Courtesy General Electric.

ged briskly down the track toward each other, rapidly gaining speed and swaying on the temporary standard gauge track laid for the occasion. The enginemen opened their throttles wide and jumped to the ground. A moment later, amid rousing cheers from the crowd, the locomotives collided with a satisfying crash.

"Never again will I witness such a spectacle," panted Mrs. Milligan while her sons threw their straw hats into the air. They moved with the crowd to the beaches, where she opened the big wicker picnic hamper and folded back the snowy napkin. "The Lord save us, John Milligan! Your children have put a dead crab in our lunch!"

That afternoon Mr. Milligan donned a long-legged, striped bathing suit and floated on his back beyond the surf with great dignity. The family listened to a band and watched the fireworks. When the Milligans, and hundreds like them, boarded the last train back to East Boston, Mr. Milligan had absorbed too many beers and the BRB&L had made enough money for two new Manchester locomotives.

Many summer celebrations added to the revenues of the little railroad; throughout each season the crowds would come from all over New England to ride the ferry and the trains, which rattled through a tunnel and over trestles to Revere Beach.

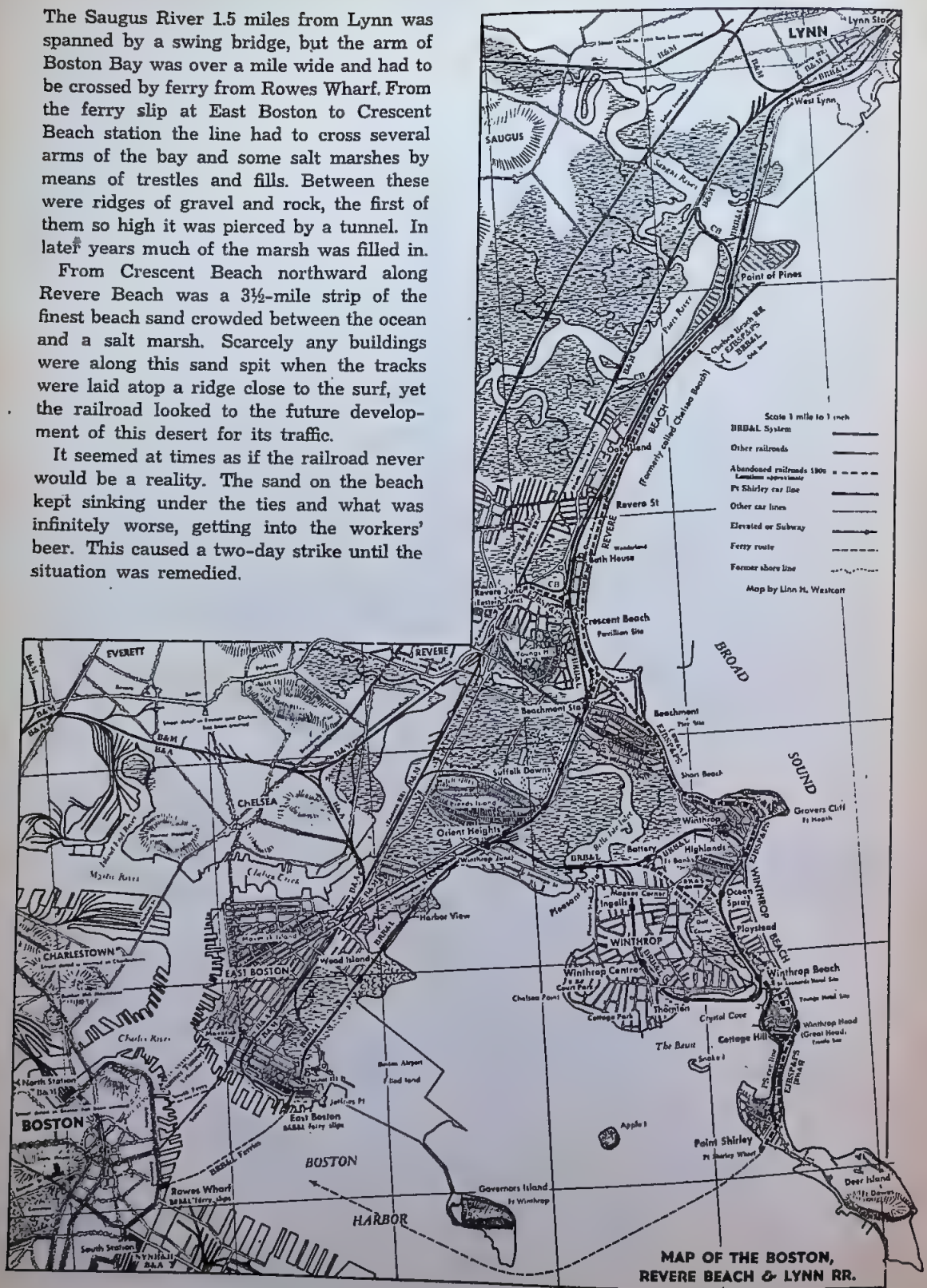
But excursionists were not the only traffic that supported the railroad. Its far terminal was in downtown Lynn, the first large city northeast of Boston. Although the Eastern Railroad, now part of the Boston & Maine, had operated trains from Boston to Lynn since 1838, Lynn residents held it in disfavor because of the location of the depot. The "depot war," which influenced a mayor's election, resulted in their backing construction of the BRB&L in 1875. Moreover, between the Eastern Railroad and the sea was a belt of land without railroad service.

Near each terminal was a body of water.

The Saugus River 1.5 miles from Lynn was spanned by a swing bridge, but the arm of Boston Bay was over a mile wide and had to be crossed by ferry from Rowes Wharf. From the ferry slip at East Boston to Crescent Beach station the line had to cross several arms of the bay and some salt marshes by means of trestles and fills. Between these were ridges of gravel and rock, the first of them so high it was pierced by a tunnel. In later years much of the marsh was filled in.

From Crescent Beach northward along Revere Beach was a 3½-mile strip of the finest beach sand crowded between the ocean and a salt marsh. Scarcely any buildings were along this sand spit when the tracks were laid atop a ridge close to the surf, yet the railroad looked to the future development of this desert for its traffic.

It seemed at times as if the railroad never would be a reality. The sand on the beach kept sinking under the ties and what was infinitely worse, getting into the workers' beer. This caused a two-day strike until the situation was remedied.



MAP OF THE BOSTON, REVERE BEACH & LYNN RR.

It was also apparent that the people along the line did not appreciate the service they were about to receive. They said: "We don't want all the riffraff of Boston at our back doors." When the road was nearing completion, they gathered at the spot where the two construction crews were to meet and refused to let them finish. Late that night the construction boss awoke his men and had the line completed before the settlers appeared the next morning. (Here the Point of Pines station was later built.) In spite of the objection of the Revere folk, the line carried 1075 passengers on that first day, July 29, 1875. Railroad-minded Bostonians were impressed with the 30-pound rail, for 15- and 20-pound was then standard for narrow gauge. "This road is built to last," President Blake announced. And so it did, probably because between 1885 and 1904 the entire line was relaid with 50- and 60-pound rail.

The BRB&L soon built a large hotel, the Pavillion, at its Crescent Beach stop. It was so constructed that trains went right through the building, which served as a station, while excursionists ate and danced on the upper floors. The popularity of rapidly growing beach concessions like this one naturally attracted other railroads.

The newer development came first to Winthrop Peninsula, a triangle of land extending three miles to the east and south of the BRB&L line (see map on page 32). This area was previously reached only by a financially embarassed horse car line. When the BRB&L was built in 1875, it bypassed the few farms of Winthrop and the group of fishing huts and small resorts on Point Shirley. Two years later, the Boston, Winthrop & Point Shirley, another narrow gauge railroad, ventured out to develop this land. It connected with the BRB&L at Winthrop Junction, now Orient Heights, and extended east at first to Magees Corner but later to Great Head. Following the pattern of the BRB&L at Crescent Beach, the "peanut line" combined a station and hotel at St. Leonard.

The profitable north shore attracted a third railroad in 1881. The Chelsea Beach Railroad was built by the Eastern Railroad from a junction on the Eastern Railroad to Point of Pines where it turned back to the ERR main line. This line was standard gauge, as was the Eastern Junction, Broad Sound Pier & Point Shirley, built the following year. The latter line radiated three ways from Crescent Beach, to Point of Pines along the present route of the BRB&L line, to the main line of the Eastern Railroad at Revere Junction and southeastward on Winthrop Peninsula to Point Shirley Wharf. Here it met the steamers *Baltimore* and *Philadelphia* that brought excursionists from Boston. The standard gauge road passed over the BRB&L on a trestle between Crescent Beach and Beachmont, the site of a large pleasure pier. Frequent storms kept the Winthrop section of the railroad afloat most of the time, although it was held down by stakes and chains all along Broad Sound.

When the many initialed EJBSP&PS found its way to Point Shirley at the tip of Winthrop Peninsula, it soon merged with the BW&PS as the Boston, Winthrop & Shore. A third rail was laid from Ocean Spray to Cottage Hill on Point Shirley for BW&PS narrow gauge trains, but this section was abandoned after the Thanksgiving storm of 1885. For many years piles could still be seen east of Great Head, around which the line had been carried on a trestle. Elsewhere the companies stoutly defied the high spring tides which washed away their tracks each year.

The Boston, Revere Beach & Lynn leased these roads in 1886, completed the loop of track around Winthrop and eventually abandoned all of the standard gauge lines. Trains operated around the Winthrop Branch every half hour in alternate directions. After consolidation of the lines in 1891, the BRB&L built an additional tunnel at East Boston and ran through service from Winthrop to East Boston. Double tracking of the system, begun in 1886, was complete by 1903. The railroad did not attempt service to Point Shirley again until it acquired the Point Shirley Street Railway in 1912. This electric railway, built in 1910, was operated until a storm wiped it out in 1928 and it became a bus line.

A popular spot in the '80's was Point of Pines, a point of scrub pine trees at which some hopeful entrepreneur had erected a large hotel, the Ocean House. The railroad added a bandstand and park. Traveling Wild West shows stopped here, and every summer evening Baldwin's Boston Cadet Band serenaded the public. In 1881 the largest hotel in New England, the Pines, gave the resort a natty air. After a brief period of popularity the park waned, and by the turn of the century the hotels were razed.

In the '90's the Beach proper received some improvements at the hands of the Metropolitan District Commission. Besides clearing away mushroom shanties which had cluttered the

Top to bottom: W. H. Butler Jr., Railway & Locomotive Historical Society, W. H. Butler Jr., H. S. Walker.

Old structures on the BRB&L include (from the top down): Winthrop Beach station in 1890 showing trestles used until the land was filled in; the marshland in rear later became a golf course. BRB&L Leo, a 4-4-0 built by Hinkley in 1876 and sold to Brown Co. of Florida in 1883; the white building is St. Leonard Hotel on Winthrop Beach. Winthrop Centre station was used until the abandonment of the railroad although the tower did not remain. Lynn station is shown as it was around 1880, before its tower also was removed.

coast line, the commission planned a roadway and promenade beside the beach. To make room for it the BRB&L had to relay its tracks 25 feet back from its original position. The line built a new Crescent Beach station but the original Pavillion remained for many years as a dance hall and amusement center. Revere Beach and Crescent Beach continued to offer a variety of entertainment. In later years two race tracks, one at Suffolk Downs and the other near Revere Beach station, furnished more passengers for the BRB&L.

For years tiny tank engines hauled trains up and down Revere Beach to Lynn and around Winthrop all day long. As the population of these North Shore communities increased, they added a thriving year-round commuter traffic to the line's bustling summer excursion business. Patrons could count on a train every 10 minutes, and there were often special eight-car trains for excursions or at rush hours. White flags were a common sight, especially on the last

H. S. Walker.

BRB&L No. 2, Pegasus, ran on the Boston, Winthrop & Shore Mason in 1875, it spent 10 years on the Winthrop branch. Picture was taken when loop had just been double-tracked. even before BRB&L had leased the smaller line. Built by

train from Revere Beach on weekends, which sometimes left after three in the morning. Fare was only 10 cents from Boston to Lynn, including the ferry trip, and five cents between stations. After 1928 the rates went up five cents. In every year prior to 1929 the BRB&L averaged between 15 and 20 million passengers, probably the largest traffic of any narrow gauge line. Dividends to the stockholders were handsome too.

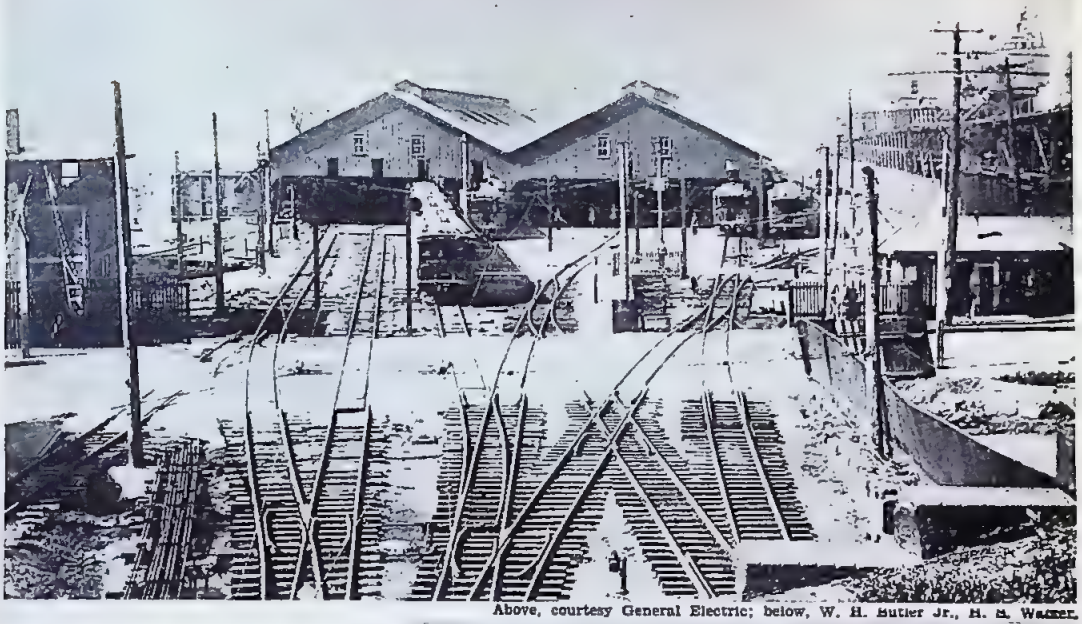
At the height of its activity the BRB&L operated 26 locomotives, 96 coaches, and four ferries, but in its first year the railroad owned only three locomotives—the *Orion, Pegasus,* and *Jupiter*—seven coaches, 14 freight cars, and two baggage cars. The first ferries were the *Oriole* and the *Union.*

Familiar to BRB&L passengers were the William Mason bogie type tank engines. These flexible engines were well adapted to narrow gauge roads and partially anticipated modern articulated locomotives. Drivers and cylinders were carried by a truck frame while the usual type arch-bar truck supported the rear end of the locomotive. The Eames vacuum brake was used on these engines long after other locomotives had air brakes. The steam chest oilers were also old style instead of the more usual sight-feed lubricator or mechanical pump. The first of these locomotives were 2-4-6's, which later were rebuilt to 2-4-4's identical to all BRB&L locomotives since then. After Mason went out of business, Taunton, Manchester, and finally Schenectady built the road's steam locomotives.

Prosperous as it was, the BRB&L at one time was very grateful to get a second-hand locomotive. A fire destroyed the Orient Heights engine house in 1895, completely ruining some of the engines inside. Since all of the engines were on the repair list for over a year, the line was very short of power. A new timetable with a reduced schedule was issued, but even then the locomotives broke down constantly through overwork. Fortunately the Boston & Maine had standard gauged its Profile & Franconia Notch Railroad during this time. It sold a 4-4-0 cap-stacked Hinkley, built in 1879, to the narrow gauge road. The 4-4-0 did not prove suitable for short, fast runs, however; the BRB&L had had the same experience with the 4-4-0 *Leo* before. In 1901, as soon as the road could do without it, it was sold to the Nantucket Railroad. Meanwhile the BRB&L resumed regular service without having every locomotive in service all day long.

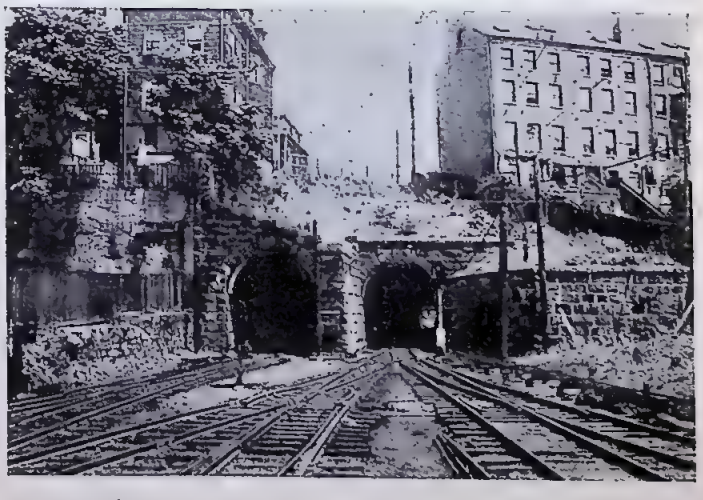
The original coaches were finished in hardwood with plush upholstering and silver plated mountings. They were built by Laconia Car Co. and hauled from Laconia, N.H., on standard gauge trucks. Cars 5, 3, 13, and 14 were shipped down to the East Tennessee & Western North Carolina Railroad in 1910. Later they went to the East Broad Top Railroad in Pennsylvania, where they are still in service. Many a GI has seen other wooden BRB&L coaches on the Oahu Railway in Hawaii. Summer visitors in Maine may have ridden on BRB&L ferry *Swampcott,* for this ferried passengers from Portland to Peak's Island in Portland Harbor after 1914. The *City of Lynn* went to the Atlantic Shore Line Railway for use between Portsmouth, N.H., and Kittery, Me. The *Newton, Dartmouth, Ashburnham,* and *Brew-*

All photos this page, W. H. Butler Jr.



Above, courtesy General Electric; below, W. H. Butler Jr., H. B. Wagner.

An evening express (top of opposite page) passes remains of the Pleasant Street car house along Crystal Cove. The picture below it shows the Orient Heights shops. At bottom a Boston bound mid-day train crosses Saugus River. The terminal shed at East Boston after electrification is shown at top. Right, a mustached crew poses at East Boston soon after the second tunnel was built. The tower and brewery were later torn down. Below, narrow gauge tunnels at East Boston.



ster were the die-hard ferries, however. They churned back and forth across the harbor until the line was abandoned and they were sold for scrap.

By a combination of accident and enterprise, the BRB&L in its early years became the first railroad to use the telephone for train operations. An experimental iron wire was strung up between Boston and Salem in 1876, only six months after Bell had made his first telephone call. Edward Whorf, a forward looking superintendent, realized that the telephone line, which followed the tracks of the railroad, would be

useful in governing train movements. He bought a section of it after the experiments were successfully completed. Other railroads looked askance and it was 18 years before the Pennsylvania adopted the innovation. The BRB&L was also one of the first steam roads to be equipped entirely with automatic block signals and to use the Walschaert valve gear.

By the middle '20's the function of the BRB&L was fast disappearing. The ferry trip, always a count against it, was a greater disadvantage now that the Boston business district had moved away from Rowes Wharf. The competition from automobile traffic increased rapidly. The directors decided in 1927 to electrify the entire line for more efficient service, since new steam locomotives would not be well adapted to the frequent stops along the line—nearly two per mile. The company hoped for a high speed line with no soot or smoke, less noise, and perhaps another real estate boom along the right of way.

Accordingly the BRB&L doubled its capital stock and issued bonds for $2,000,000 due in 1947. General Electric received the contract to electrify the narrow gauge road. Soon 60 of the 96 coaches then in service were equipped with two 60 horsepower motor trucks, and automatic air brakes replaced the old vacuum brake system. The cars had dead man control and Miller trolley shoes, a new idea at the time. The running time was reduced by 10 to 15 minutes.

The electrification was carefully fitted to the needs of the line. Since atmospheric conditions along the ocean were harmful to iron and steel, many bridge structure fittings were made of bronze and the upper wire was of heavy copper. The contract included 10 trailer cars, a transformer car, and three electric substations supplying 600 volts D. C. to the contact wires. Even the stations and terminals shared in the modernization; passengers now paid as they entered through electric turnstiles.

One factor was forgotten, however, as chilly passengers discovered on a December day in 1928. The coaches were like rolling ice boxes because there was only one heater coil under every fourth seat. The management hastily pulled locomotives off the rip track to heat the electric cars. These were located at Boston, Orient Heights, and Lynn all through the winter and steam was kept up just to heat cars. Then the entire flock of 25, some only 14 years old, was shipped to Pennsylvania steel mills on B&M freight cars. No. 14 remained as a heater for the car shop at Orient Heights.

Although real estate values did go up, so did taxes on the right of way. Power proved expensive. The trains were no longer crowded and many were pulled off. In 1933 the line bought four one-man street cars from the Eastern Massachusetts Street Railway for night service and mounted them on narrow gauge trucks. These cars, the only steel cars the

The Boston, Winthrop & Point Shirley owned some rolling stock and one locomotive although it leased others from BRB&L. Here is a train of BW&PS cars on the old trestle that went around Great Head or Winthrop Head.

J. W. Barnes, Southbridge, Mass.

BRB&L ever operated, were called "owls" because they went on at night after the evening rush. Commuters had a train every 25 instead of every 10 minutes, with extras during rush hours. Except in these hours most of the prepayment stations were closed and fares collected on the trains. The payroll went down from 1000 employees in 1930 to 300 in 1936. Those remaining volunteered to take a 5½ per cent cut in salary rather than face unemployment. No longer did the BRB&L have two college boys to take tickets in every car as in the plush summers of the '20's.

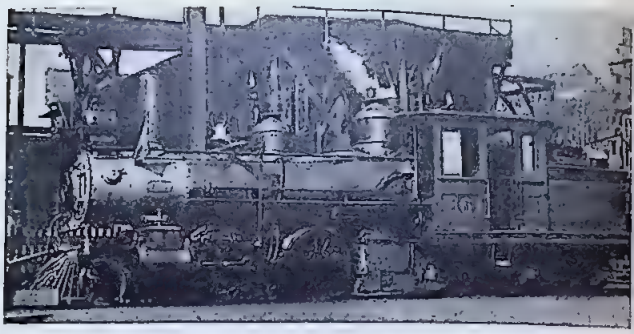
By 1940 the line could not continue operations, for it could not even afford to repair its equipment. The tracks required new ballast and ties, and the 40-year-old ferries continually needed repairs. The *Dartmouth* had twice broken down in the harbor and been rescued by passing tugs. Abandonment of the BRB&L would be a hardship only for people on the Winthrop branch, because the narrow gauge furnished their only transportation to Orient Heights. Excursionists, and commuters who lived east of Orient Heights or along the Beach could take the Ocean Avenue car of the Boston Elevated Railway system. The Boston & Maine had a fast line from Boston to Lynn. The Sumner vehicular tunnel under Boston Harbor connected with super highways which paralleled the railroad. Also, junk prices were going up because of the impending war. Thus, in spite of petitions from Winthrop residents, the court ordered the abandonment of the BRB&L at midnight on January 26, 1940.

After the railroad was sold at auction for $118,756, salvage dealers went to work. Coaches, rolled onto a siding in Orient Heights, were dumped from their trucks and burned. All metal except the power trucks went for scrap. These and the transformer car became property of the Eastern Massachusetts Street Railway and are still in storage. The engine house at Orient Heights is a casket factory now, but all BRB&L local stations have been razed. The two-story brick building at Rowes Wharf in Boston still stands, as do the tunnels over in East Boston. Along the ocean front where the tracks were raised above flood tide, the sturdy roadbed and barnacle clustered trestles still keep the sea from washing away innocent tenements.

There were no gay crowds on that last trip from Lynn along the Beach to East Boston. The train of four old open end coaches came out of the tunnel at midnight in a heavy fog. Crossing the street it came to a noisy stop inside the train shed. A few late passengers and one or two railfans climbed down, walked the length of the platform to the ferry slip. The tide was in. They walked up the slip and boarded an old red ferry with the name BREWSTER painted in large gold letters on its sides. Lines were cast off, the walking-beam engine began turning the sidewheels, and the old craft vanished into the fog.

After the two Winthrop lines consolidated, the Boston, Winthrop & Point Shirley's only locomotive became the Boston, Winthrop & Shore No. 1, shown here at Cottage Hill. It was later scrapped by the BRB&L in 1893.

Railway & Locomotive Historical Society.



G. F. Starbuck, Railway & Locomotive Historical Society; H. S. Walker.

Locomotives of the Boston, Revere Beach & Lynn Railroad

No.	Name	Wheels	Driver diam., in.	Cyl. diam. and stroke, in.	Builder	Builders' No.	Date built	Remarks
1	Orion	0-4-4	36	10x15	Mason	508	1875	See note 1.
1		4-4-0	39	12x18	Hinkley		1879	See note 2.
1		4-4-0	49	12x18	Manchester	1873	1903	Scrapped 1928.
2	Pegasus	0-4-4	42	10x16	Mason	549	1875	Leased to BW&S 1883. Returned to BRB&L 1892. Burned at Orient Heights 1896.
2		2-4-4	49	14x18	Manchester	1707	1899	Scrapped 1928.
3	Jupiter	0-4-4	42	10x16	Mason	550	1875	Scrapped 1896.
3		2-4-4	49	14x18	Manchester	1708	1899	Scrapped 1928.
4	Mercury	2-4-0			Porter, Bell & Co.		1876	Leased to BW&PtS 1878.
4		2-4-6	48	14x18	Mason	683	1882	Scrapped 1904.
4		2-4-4	49	14x18	Manchester	1975	1904	Scrapped 1928.
5	Leo	4-4-0			Hinkley	1240	1876	Sold to Brown Co. Florida 1883.
5		2-4-4	49	14x18	Mason	720	1885	Rebuilt Manch. 1917, scrapped 1928.
6	Draco	0-4-4	42	10x16	Mason	559	1876	Scrapped 1885.
6		2-4-4	49	14x18	Mason	727	1886	Rebuilt Manch., scrapped 1928.
7		2-4-6	48	14x18	Mason	684	1882	Rebuilt Manch. to 2-4-4, scrapped '28.
8		2-4-4	48	14x18	Mason	692	1883	Scrapped 1900.
8		2-4-4	49	14x18	Manchester	1741	1900	Scrapped 1928.
9		2-4-4	49	14x18	Mason	740	1887	Scrapped 1928.
10		2-4-4	49	14x18	Mason	741	1887	Scrapped 1928.
11		2-4-4	49	14x18	Taunton	981	1890	Rebuilt Manch. 1917, scrapped 1928.
12		2-4-4	49	14x18	Taunton	982	1900	Rebuilt Manch. 1920, scrapped 1928.
13		2-4-4	49	14x18	Manchester	1742	1900	Scrapped 1928.
14		2-4-4	49	14x18	Manchester	1799	1902	Used as heater for shop 1928.
15		2-4-4	49	14x18	Manchester	1874	1903	Scrapped 1928.
16		2-4-4	49	14x18	Manchester	1976	1905	Scrapped 1928.
17		2-4-4	49	14x18	Manchester	2054	1906	Scrapped 1928.
18		2-4-4	49	14x18	Manchester	2118	1907	Scrapped 1928.
19		2-4-4	49	14x18	Manchester	2119	1907	Scrapped 1928.
20		2-4-4	49	14x18	Manchester	2120	1907	Scrapped 1928.
21		2-4-4	49	14x18	Manchester	2121	1907	Scrapped 1928.
22		2-4-4	49	14x18	Manchester	2352	1912	Scrapped 1928.
23		2-4-4	49	14x18	Manchester	2353	1912	Scrapped 1928.
24		2-4-4	49	14x18	Schenectady (Alco)	54590	1914	Scrapped 1928.
25		2-4-4	49	14x18	Schenectady (Alco)	54591	1914	Scrapped 1928.
26		2-4-4	49	14x18	Schenectady (Alco)	54592	1914	Scrapped 1928.

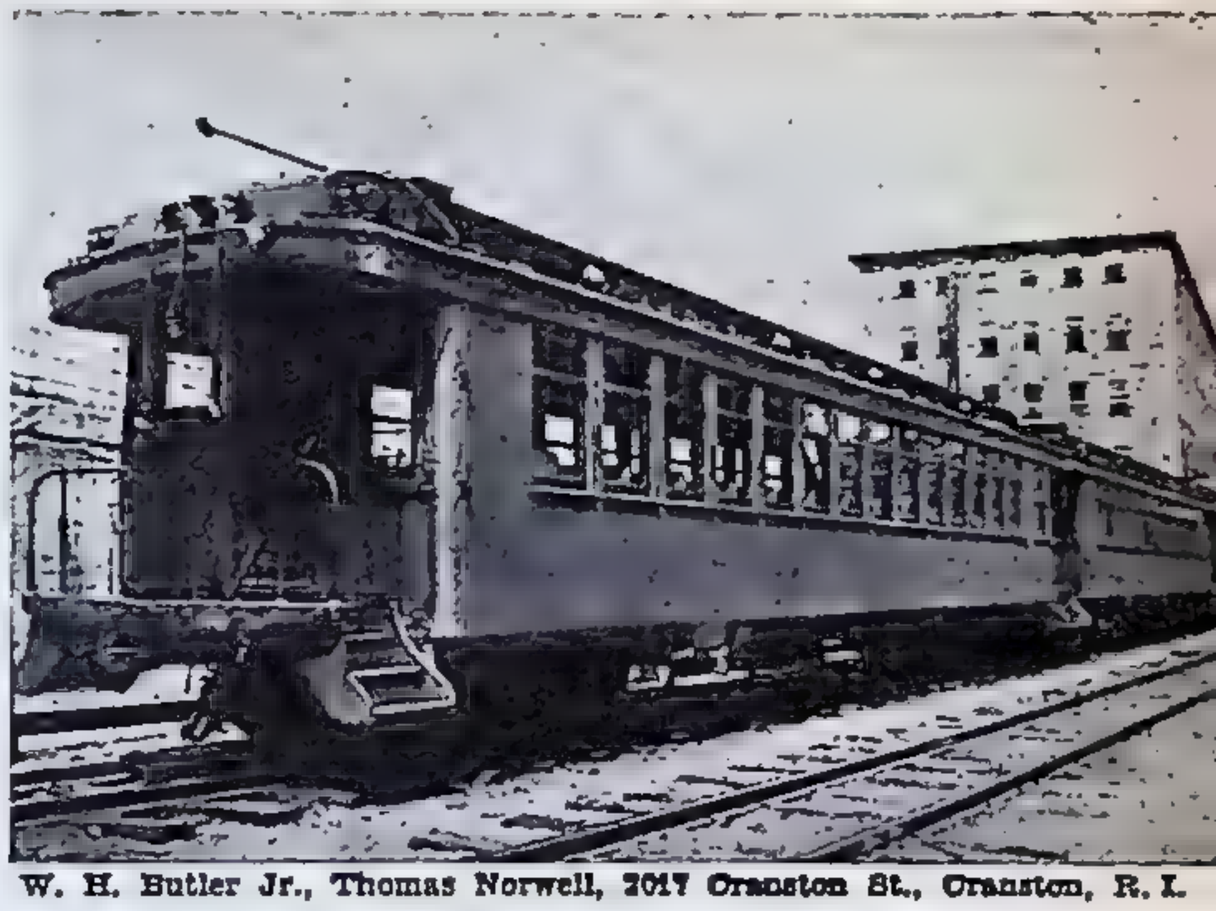
1. Originally built for North & South Railroad of Georgia. Fell through trestle near Rome, Ga., returned to Mason who rebuilt it and sold it to BRB&L in 1875. Sold to Nantucket Railroad in 1888.

2. Bought from Boston & Maine in 1899. Ex-*Profile* of Profile & Franconia Notch, later Concord & Montreal No. 99 and B&M No. 799. Sold to Nantucket Railroad in 1901.

Boston, Winthrop & Shore No. 1 *Winthrop*, and 0-4-4 saddle tank engine built by Porter Bell & Co., came to the BRB&L with the Consolidation in 1892. Scrapped in 1893.

East Junction, Broad Sound Pier & Point Shirley had one standard gauge locomotive leased from the Boston & Lowell or the Fitchburg.

Locomotives 1, 2, 3, and 8 were burned in an enginehouse fire at Orient Heights in 1896. They were rebuilt.



W. H. Butler Jr., Thomas Norwell, 2017 Cranston St., Cranston, R. I.

Revere Beach Rolling Stock

BRB&L wooden passenger coaches before and after electrification are shown at far left and right. Cables on the roof of the electrified coach are the control and bus jumpers between cars for multiple unit operation. Four of these coaches are still in service on the East Broad Top in Pennsylvania and others are operating on the Oahu Railway in Hawaii. At right is No. 9, an early open end coach that was later used as a trailer car.

The BRB&L ordered a 4-4-0 Hinkley, the Leo, (top) in its second year of operations. The Leo was less satisfactory for short, fast runs than the Mason and Manchester 2-4-4's. The road had 15 Manchester locomotives similar to the 2-4-4T on the opposite page, shown in East Boston. At bottom is another Manchester 2-4-4T, built in 1902 and later used as a heater for the car shop at Orient Heights after electrification. Notice that the reverse rocker shaft goes over the top of the boiler.

Above, G. F. Starbuck; below, W. H. Butler Jr.

The Darjeeling Himalayan

Take a ride into the clouds on a two-foot gauge railway with which many of our GI's have become familiar while in India

BY ALLAN D. KRIEG

The station master at Sukna flung a question at the engineer of the *Darjeeling Mail* as he backed along the platform from which just a few minutes before it had departed, headed north into the Himalayas.

As the little train eased to a stop the engineer shouted in a Nepalese dialect that a herd of wild elephants had come crashing through the *terai* and challenged the right of way of his train. What engineer would defy even one wild elephant which was larger than the locomotive, much less defy a whole herd of the creatures? So he'd just backed his train to the station to wait until they'd cleared the tracks.

That happened in India on the Darjeeling Himalayan Railway in the early 1900's. Today, although tiger and leopard are still to be found in the deadly malarious *terai,* the belt of jungle between the plains and the mountains, the wild animals no longer stop the trains.

Imagine in India, a country where the most common mode of cartage is by tonga, ricksha, ancient creaking bullock carts, or on the heads of sweating, shouting coolies, a railway skirting the edges of forbidden lands; a railway old-fashioned in its method of traffic control, train brakes, and train linkage; yet progressive to the degree of operating a streamlined locomotive pulling modern, comfortable passenger cars, experimenting with a semi-streamlined Diesel locomotive, and making use of radio in communication between terminals.

That is the DH, a line for the railfan. Its herald bespeaks its purpose: To climb the Himalayas to Darjeeling. The name of the line encircles a picture of jagged snow-covered peaks against a blue sky.

The main line of this two-foot gauge railroad terminates at Darjeeling high in the Himalayas of northeastern India. Two branch lines run to Kishanganj, in the rice paddies of the Ganges Plain and to Gielle Khola up the canyon of the Teesta River. All start from Siliguri in upper Bengal Province where they connect with the Bengal & Assam Railway's 5-foot 6-inch gauge line from Calcutta.

With the establishment of the tea industry in the district work on the line was begun at Siliguri in 1879 and two years later trains were climbing 51 miles of steep and tortuous way to Darjeeling.

By 1915 the branch from Siliguri running along the Teesta River's beautiful canyon was opened. Down this line flows traffic from the protected state of Sikkim and the forbidden land of Tibet. It is funneled through Kalimpong, the trade center of these two countries, located 3300 feet above and seven miles from the railway's nearest siding at Rilli. An aerial tramway owned by the DH runs from Rilli over 12,800 yards across the Teesta and up to Kalimpong. For 4½ miles from Rilli siding the track runs to the terminus of that branch at Gielle Khola.

Most of the traffic on the Siliguri-Kishanganj branch is freight and consists mainly of rice and raw jute. At one station, Galgalia, a mile from the Nepalese frontier, the annual rice export runs around 14,000 tons. From Galgalia, 29 miles out of Siliguri, the line continues for 41 miles to Kishanganj, connecting there with a 3-foot 3⅜-inch (meter) gauge line of the Bengal & Assam.

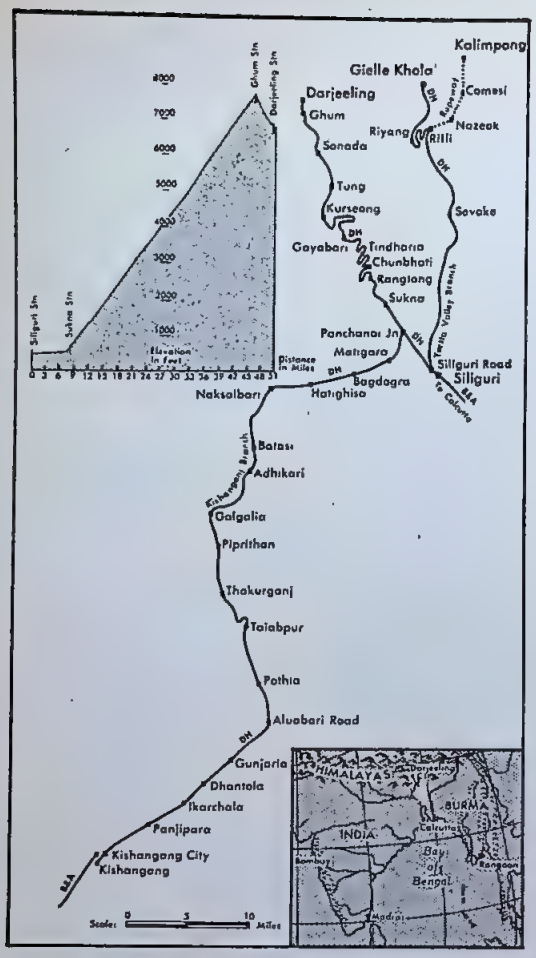
The main line and the most picturesque is the 51 miles of track from Siliguri to the popular mountain resort town of Darjeeling.

Revenue of the main line is earned chiefly from carrying freight although wartime has greatly increased the passenger traffic. The heavy flow of people escaping from the heat of the plains to Darjeeling and Kurseong begins in the spring and ebbs with the close of the monsoons in September. The tea grown in the district and rice make up the bulk of the freight that is carried.

With the government and engineering considerations limiting the speed to 12 miles per hour the little trains run on 50-pound rails up

All photos by Allan D. Krieg.

A Darjeeling Himalayan passenger train headed downgrade to Siliguri. The engines on the downhill trips run in reverse at the head of the trains. Lower levels of track can be seen across the valley.



grades which reach 4.3 per cent. The average gradient from Sukna to Ghum is 3.3 per cent. At Sukna, Mile Seven, where grades begin, the train is split up into three or four sections of four or five cars each. With their 0-4-0 class B hill engines the trains start their real ascent which in 40 miles rises steadily from 533 feet above sea level to an altitude of 7407 feet on the Singalela Range of the eastern Himalayas. This range ends 45 miles beyond Darjeeling in the mighty peaks of Kabru, Jannu, and Kanchenjunga, the world's third highest mountain.

A traveller bound for Darjeeling boards the B&A's train No. 1, the *Darjeeling Mail,* at Sealdah station, Calcutta, and leaves there at 7:00 p.m. Next morning there is time for breakfast served by barefoot, white turbanned *bearers* at Siliguri Station before the passenger crosses the platform to find his seat on the Darjeeling-Himalaya *Darjeeling Mail,* No. 1 up. It leaves at 8:00 a.m. and the fare is 10 *rupees* ($3).

The first class coaches are quite comfortable with their individual chairs and small buffet at the head of each car. The designer of these cars provided for an unobstructed view of the grand mountain scenery by allowing for large windows on the sides and rear of the coaches.

The DH is made dear to the heart of the American passenger with the first blast of its deep-toned whistle so similar to those at home. Most of the whistles fitted to India's locomotives are very shrill.

One of the first things the passenger looks for is one of the curious little narrow gauge engines which is to pull his train into the Himalayas. It is likely to be one of the first things he sees, for there are usually two or three of them shuttling back and forth or being serviced on nearby tracks by their Nepalese crews. The crews are a smiling, laughing lot, short and wiry, with unmistakably Mongoloid features. Often they are seen with leis of bright orange flowers around their necks and it is common to see one of the engines with garlands on the headlight. The engine crews are large for the size of their charge. Besides the engineer and fireman there are one or two men on the bunker atop the boiler breaking up the lumps of coal and passing them to the fireman; and one or two more on the pilot beam holding sand in readiness when stiff grades are reached and the wheels begin to slip. The driver, or engineer as he is called in America, of a hill engine on this line earns a salary of $15 to $27 a month plus wartime and family allowances which bring it up to around $55 monthly.

If he is in luck the passenger will find that the engine on his train is the streamliner rebuilt from one of the regular 0-4-0 hill types.

The platform gong is rung and the *Mail* pulls easily out of Siliguri through the yards, passes the junction of the Teesta Valley line on the right, and crosses a 700-foot bridge spanning the Mahanaddi River. Miles ahead at the 4000-foot altitude mark the train passes near the river's source. Across the river and past the red-roofed buildings of the Dagapur Tea Estate is Panchanai Junction, where, in a long curve on the left, the Kishanganj branch joins the main line. The rice paddies, with occasional Flame of the Forest trees in bright full bloom at their edges, soon give way to a jungle on one side and the Mohurgong tea garden on the other. The railway and the Darjeeling cart road share the path through the jungle. Along the road are groups of brightly clothed Nepalese;

women laughing, men each carrying a *kukri* knife in the tradition of the Ghurka soldier.

Little time is lost at Sukna, where the train is broken up and waiting engines take the sections up the grade a few minutes behind each other. Beyond Sukna the train passes through a tangled jungle of acacia, bamboo, sal, mimosa, and other trees interlaced with creepers and hanging vines standing in a wild, defiant, undergrowth of giant ferns and bamboo grass. The *Mail* rapidly climbs from the level country and soon the passenger catches glimpses of the plains far below and wonders how the roaring little locomotives can possibly make the steep grades. Before and behind his train the other sections are sometimes only a few hundred feet distant.

The heat of the plains is left behind and the traveller is glad he's taken the advice of those who've been on the line before and dons the extra garment held out from the baggage which makes the trip in a small four-wheel box car at the head of the coaches.

In keeping excessive gradients to a minimum the engineering department in some places had to incorporate loops and reverse grades. On the hill section there are four loops and five reverses. One of the loops has a radius of only 60 feet. On this curve the signalman perched on top of the last car is almost abreast of the engineer.

The railway and paved vehicular road follow each other almost continuously, constantly crossing and recrossing. When the track runs along the mountain side of the highway there is space enough to accommodate the rocking of the train and no more; ferns and grasses springing from the rocky side brush the windows of the coaches. Crossing the road to the outside the train hugs the edges of deep ravines.

Along about this time, the passenger thinks uneasily about railroad accidents in general and on this line in particular. Upon inquiry he will be relieved to learn that in the history of the DH there have been remarkably few serious accidents although there are frequent minor derailments. To take care of these each engine is provided with a heavy wooden pry bar about 12 feet in length which is carried on a rack on the right side of the boiler. Traffic is not long held up after an insignificant derailment when the crew goes to work with this handy piece of equipment.

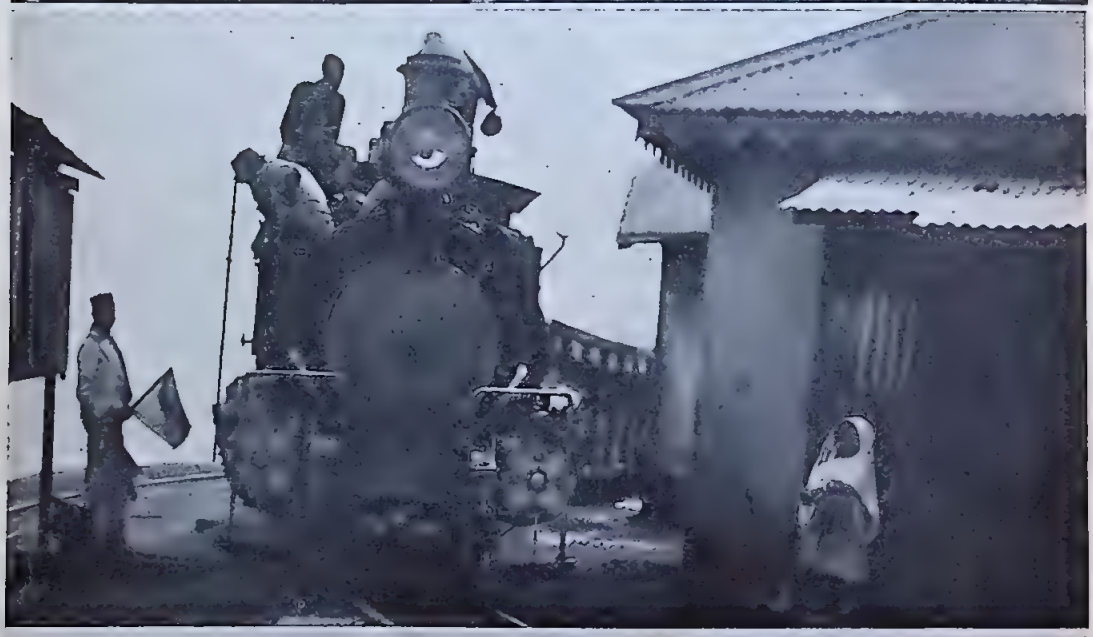
Safety engineers would probably frown upon the use of the train following system of traffic control as used on the main line. The absolute block system is in use on the plains section.

They would most surely frown upon the braking methods. The engines are equipped with steam and mechanical brakes while the cars have only mechanical brakes. The locomotive brakes seem capable of doing their job as long as the links and pins and safety chains keep the train as a unit.

With the monsoon rains in summer and early fall comes the greatest threat to the line. During these heavy rains landslides often occur. The worst of these came in 1942 when one of the loops was carried away and through traffic was held up for three months. This loop was replaced with a reverse grade when the roadbed was rebuilt.

Between Siliguri and Darjeeling the principal stations are Sukna, where the train is shortened for the climb; Tindharia, where the company's

Darjeeling station, in lower right, clings to the mountainside. Kanchenjunga, third highest peak in the world, tops the snowy range 45 miles distant. Beyond the peaks lies Tibet. Mount Everest, 100 miles to the northwest, can be seen from Tiger Hill, above town.



The Darjeeling Mail arrives at Kurseong where passengers for Darjeeling have lunch in either the European, Hindu or Muslim refreshment rooms. The several sections of the train all pull up side by side during stop.

The Darjeeling Mail does some real winding up and out of Tindharia station. The men atop the engine are coal breakers who pass coal from bunkers to the firemen. The railings are for sanders who ride the pilot beam and sand rails when the stiff grades are reached.

A passenger train winds around the upper level of the complex Bhatasia Loop between Ghum and Darjeeling.

shops are astride a mountain spur; Kurseong, a stop for lunch and the location of the DH general offices; and Ghum, the highest point on the line, 7407 feet above sea level and 47 miles from Siliguri.

Many more stops are made along the way, most of these being for water. At every one of these stops children come alongside the train, some with baskets of oranges and bananas for sale, some asking for *bahksheesh* (alms), and some just curious. One of the stops for water is at Paglo Jhora (the Mad Torrent) where a young and pretty Nepalese girl wearing a black and white *saree* sells cigarettes.

At lunchtime the train pulls into one of the sidings at Kurseong station and within a few minutes the other sections of the *Mail* arrive; the following section stops on the second track beside the station and the other two on the main line and on an outer siding. Meals are served at the European refreshment room. There are also Hindu and Muslim refreshment rooms where Indian dishes are served. Kurseong is a hill station, as the mountain towns are called, but has a milder climate than Darjeeling.

The main line curves along with the road through the bazaars of Kurseong and Ghum. One can lean out of the window and almost touch the fruit or cloth or trinkets on sale as the train winds its way past the open front shops.

Ghum, on one of the trade routes to Nepal and Tibet, is reached after an hour and a half from Kurseong, and 30 minutes later, as the train goes over and around and under Bhatasia Loop at Mile 48, the tourist is rewarded with one of the grandest sights on earth. Before him stretches Darjeeling, straddling a ridge curving to the left where the mountainside drops away into a deep canyon. Across this canyon is the Indian state of Sikkim and from it rises a massive panorama of peaks topped by Kanchenjunga's twin crests which are flanked by six other summits, the lowest being 19,150 feet above sea level and 32 miles away. Within a few minutes the train hoots its way into the red-roofed passenger station at Darjeeling where coolie women clamor to carry the travellers' luggage, however heavy, on their backs to waiting rickshas or taxis.

A siding runs on into town for half a mile serving warehouses and terminates at the Darjeeling Ropeway, an aerial tramway running 5½ miles down into the canyon.

Almost every visitor to Darjeeling and the DH makes the sunrise trip to Tiger Hill, 1700 feet above the town, to see Mt. Everest, a hundred miles to the northwest.

The engines are not turned around on the diminutive turntable at Darjeeling. They make the return trip in reverse at the head of the trains. A headlight on the cab top facing the rear of the engine is used for night trips down the mountains. The engineer and fireman are protected from the weather by a canvas curtain hung across the back of the open cab.

In order to see the Teesta Valley branch of the DH one may make the return trip to Siliguri by hiring a small car for a two-hour drive from Darjeeling across the mountains and down to Gielle Khola station and there boarding the train which follows the Teesta River.

The grades on this line are slight and the train is run in one section. The mixed train, No. 42 down, which leaves Gielle Khola at 3:15 p.m., arrives at Siliguri at 9 p.m. No. 2 down, the *Mail* from Darjeeling, arrives at Siliguri at approximately the same time and both connect with the B&A *Darjeeling Mail* which reaches Calcutta the next morning.

Of the Darjeeling Himalayan's 39 locomotives, 34 are of the class B 0-4-0 hill type; two are class C Pacifics used on the plains; one is a class A 0-4-0 switcher; one is a class D 0-4-0 + 0-4-0 Garratt type; and the remaining one is a Diesel.

The class B's are 14-ton tank engines with a capacity for 1500 pounds of coal and 400 gallons of water. They work at 140 pounds steam pressure with an 11-inch bore and 14-inch stroke. The 26-inch drivers run inside the main frame with cranks and counterbalances outside the axle boxes. These engines develop a 6840-pound tractive force. On the hill section the drawbar load is 32½ tons while on the plains it rises to 110 tons, over three times that in the mountains. Length of the locomotive is 19 feet 2½ inches

and its height is eight feet six inches. The grate area is 8¾ square feet, the total heating surface 310 square feet. The valve gear is Walschaert type. Thirty-one of these class B engines were built by the North British Locomotive Co., and Sharp Stewart's Atlas Works, both in Glasgow, and three are products of Baldwin in Philadelphia. All rebuilding is done at the company's shops at Tindharia with the exception of the boilers which are built in Calcutta.

Nos. 37 and 38, 4-6-2 type, present a problem when it comes to repairs. The shops at Tindharia are located on the hill section at an altitude of 2800 feet and a distance of 18 miles from Siliguri. Several attempts have been made to take the Pacifics up there when repairs became necessary but sharp curves and steep grades presented too great obstacles. However, at some inconvenience, satisfactory repairs are made on them at the Siliguri running shed. Their 160-pound working pressure is maintained with 835 square feet of heating area. These engines, quite large for a two-foot gauge railroad, work only on the plains with a drawbar load rated at 220 tons.

Oldest locomotive on the line is the class A used for switching in the Siliguri yards. Smaller, but similar to the regular class B hill engines, it is in its 64th year of service.

It is not generally known that the DH operates a Garratt. This engine, No. 31, is an early one, built in 1910 by Beyer Peacock & Co. in Manchester, England. With a capacity for one ton of coal and 850 gallons of water and a total heating area of 667 square feet it works at 160 pounds pressure and generates a tractive force of 15,630 pounds.

The statements for 1943 declare the line to own 382 goods wagons (freight cars) which are, for the most part, four-wheel gondola and box car types. These latter cars are midgets with steel bodies six feet wide, seven feet eight inches high, and 12 feet long. Their wheelbase is five feet. Sixty-seven of these were built at Tindharia from 1940 to 1943. The total number of passenger cars in operation in 1943 was 103. The coaches, which vary from 26 feet to 32 feet in length, have a width of six feet nine inches. This width, together with the narrowness of the gauge and the small cut of the roadbed at some places on the steep mountainsides, causes quite a thrill when the passenger looks out and sees only a drop into deep, jungle-tangled canyon.

The 1943 statement also reveals that the profit from operating the main line amounted to 659,000 rupees or about $198,000, and that the total cost of the road including the two branch lines to date has been $2,816,000. During the year 1942-1943 the DH carried 200,000 passengers on the main line. An average of six daily freight trains each way hauled 52,000 tons of goods during that year. The average trainload was a little over 12 tons.

As with most of the rest of the world's railways, the war has brought prosperity and problems to the little hill line. Keeping up with the times, and dealing with the increased passenger and freight traffic, it has introduced many new ideas and improvements in the last three or four years. An example of this is the installation of radio transmitters and receivers which has done away with the dependency on wires, always in danger of being washed out during monsoons. Another step in modernization, although not yet successful, has been the introduction of Diesel power.

At the Indian government's request, a four-car ambulance train was built in 1943 to carry injured and convalescent troops to a military hospital in the hills. This train is a conspicuous sight with red crosses on its white sides. Each car has space for eight beds.

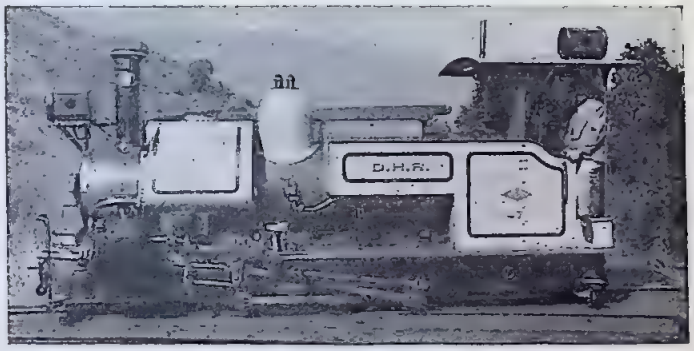
In 1942, five newly-designed

The Darjeeling Mail on one of the five reverse grades on the line. The Mail has just come up the lower track and is now backing along the intermediate section before switching to higher level.

first class coaches were built at Tindharia shops. These cars are each provided with 19 armchairs, large windows which can be raised or lowered, a small refreshment bar, and lavatory. They are six feet three inches wide and eight feet four inches high. Four of them are 26½ feet long and one is 29 feet 10 inches in length, having a rounded observation space. An interesting sidelight is the fact that most of the lumber used in building the cars is acquired in the log form and cut and finished in the small saw mill at the Tindharia shops.

Naturally, with a train of five good looking cars a locomotive in keeping with the idea was to be desired. The design which followed called for the coal bunkers to be removed from one of the class B 0-4-0's, a new tender to be built, and a sheet metal shell of streamlined shape to cover the engine. To allow for a better contour a three-foot extension was added to the main frame of the engine. The train is an overall silver gray with a blue trim.

That is the Darjeeling Himalayan Railway; only one of the many narrow gauge lines in India, but probably by far the most interesting.



Experimental Diesel locomotive built in Calcutta in 1942. This engine has not been too successful on the hill section.

Class B 0-4-0 hill engine. Driving wheels are inside the frame with counterbalances, cranks and valve gear outside.

The other side of the same class of engine. The heavy wooden bar on top of the boiler is used for derailments.

One of the 0-4-0 hill engines was given a streamlined sheathing after frame was lengthened to improve the contour.

RUNNING EXTRA

Each issue of TRAINS is printed in sections known as forms which consist of 16, eight, or, as is often the case with color work, four pages each. After the various forms come off the presses, and are folded and stacked on skids, they move to this stitcher where the binding process is completed. These girls flip the forms in proper order over a moving chain which feeds the magazine into the stitcher. This is the only part of the mechanical process of preparing TRAINS which is not automatically fed. After stitching the magazines go to a cutter where the edges are trimmed. From front to rear the girls are: Marcella Netzel, Ruth Rehm, Jacqueline Swedowski, and Audrey Daniels.

"The Transit Postmark," the only journal for the railway postoffice minded railfan, resumed publication in December under the editorship of Stephen G. Hulse, active railfan and philatelist. Foreign as well as U. S. railway postoffice operations will be covered and articles of interest to the collector of R. P. O. cancellations and car pictures will be featured. Subscriptions at $1 per year (four issues) may be sent to Stephen Hulse, Sutter Rd., Glenshaw, Pa.

Recently Raymond J. Morfa, chairman of the board, Missouri-Kansas-Texas Railroad, was aboard a special train with an official party headed for the diamond anniversary of the Katy at Parsons, Kans. At 9:10 a.m. at a secluded spot a few miles north of Parsons a dozen masked bandits halted the special train for St. Louis, cut off the engine, and forced the engineer and fireman at gun point to run the locomotive onto a siding. Then they fleeced the passengers of their valuables, took the train money box and stood the passengers alongside the train with their hands in the air.

A pile of ties stacked on the track was used to stop the train. The bandits, armed with six-shooters and shot guns, were mounted and had remained hidden in a ravine near by until the special arrived. While some of their number remained in charge of the passengers lined along the train, others herded Mr. Morfa and Don Frazier, president of the Katy, back into their private car, where they forced them to remove their business clothes and don 1870 costumes. The two officials and their wives were then taken to another siding where an 1870 model train, pulled by old No. 2, renamed the "Mike Morfa," stood ready to take the party into Parsons.

Railroad

Box Seat

I live near the Minneapolis & St. Louis right of way just a few miles out of Peoria. You can see just about anything in the way of motive power on this line today. The prize train so far has been a Diesel switcher heading a string of box and hopper cars followed up by a gas-electric car with pilot and headlight removed. The gas-electric is regularly used as a combine on the mixed train. Besides the regular Mikes, we occasionally see the road's one Pacific and neat little Ten-Wheeler engines. The new Diesel streamlined freight locomotives come through so regularly you could set your clock by them. One day I saw two 2-6-6-2's, Nos. 1545 and 1548, with the tenders lettered "Chesapeake & Ohio," easing along with no loads. I wonder if they are part of the five 2-6-6-2's ordered some time ago by the M&StL.

R. T. Bice, Hannah City, Ill.

[The M&StL did order five 2-6-6-4 simple articulated locomotives but was unable to secure authority for purchase from the W.P.B. Instead it secured Diesel-electric freight locomotives with which it is now very well satisfied.—*Ed.*]

With Justifiable Pride

On occasion one of the Milwaukee Road Chicago trains, made up at Milwaukee, leaves late and when it happens those aboard are in for a real ride as the delay is often picked up. An engineer accomplishing this feat on a 75- or 80-minute run has something to be proud of, and many of the passengers think so, too. So, to make things easy when arriving at Chicago, the eagle eye unloads from his cab and starts oiling around whichever side the passengers are discharging from. He is then in a position to receive congratulations from his charges as they stream by to the Union Depot. You don't have to listen to the conversation to know what's going on when someone stops. Just watch the engineer, who starts grinning from ear to ear, pulls out his red bandanna, wipes some grime from his face, maybe blushes a little and then nods several times as the passengers move on. But if the train leaves on time and is as much as one minute late, you can't find the bloomin' hogger anywhere.

Henry J. McCord, 53 N. Jefferson St., Batavia, Ill.

How About Hotel Accommodations?

Some of your readers might be interested in the following tabulation which shows how many state capitols are served by the various railroads:

7 capitals	(2 railroads)	RI, UP
6 capitals	(2 railroads)	NYC, SAL
5 capitals	(5 railroads)	AT&SF, CB&Q, MP, PRR, SP
4 capitals	(7 railroads)	B&O, C&NW, C&O, IC, L&N, NP, Southern
3 capitals	(4 railroads)	ACL, Milw., MKT, NH
2 capitals	(13 railroads)	B&M, CofG, C&S, D&RGW, CGW, GM&O, GN, M&StL, NC&StL, Reading, Soo, Wab, WP
1 capital	(36 railroads)	
Total	69 railroads	having passenger service to the state capitals.

The above tabulation does not include Washington, D.C.

Henry T. Wilhelm, 3174 29th St., Long Island City 2, N. Y.

The Age of Advertising

In the consist of a Pennsy freight northbound out of Potomac [Wash.] yards last night I saw a new box car of the Seaboard Railway. Instead of displaying the usual advertising "Route of the Silver Meteor" or "Route of the Orange Blossom Special" it had a new slogan: Route of Courteous Service. Could this be part of a new postwar advertising campaign? Do any readers know of any other railroad changing their slogans?

Wiley M. Bryan, S1/c, U.S.N.R., Arlington, Va.

Mail

Transformation

Delaware & Hudson coaches are old wood car body coaches with open end platforms, only about 55 feet long and numbered in the 290 series. For many years they had oil lamps and coal stoves. Imagine my surprise, on a recent trip between Scranton and Carbondale on a D&H train, when I saw that these little cars had been recently outshopped and brightly painted in green and gold. Electric dome lights and steam heat lines have replaced the oil lamps and coal stoves. These cars are equipped with Hyatt roller bearings on all axles. I'll bet these are the only wooden, open end platform cars in the country that have roller bearings. Bert Pennypacker, Box 341, Coatesville, Pa.

Santa Fe Gas-Electrics

Your comment on the utilization of the *Twin Zephyrs*, running 874 miles per day, reminded me that the Santa Fe gets 519 miles per day out of its gas-electric trains which operate between Wichita, Kans., and San Angelo, Tex. Nothing like those Q trains, or the Chicago-Denver streamliners, but the Santa Fe jobs operate over dirt track most of the way and stop at all the wayside stations, so they do a pretty good job of it.

Preston George, 612 N. Hightower, Altus, Okla.

Fighting Words

What does the Diesel have that the steam loco hasn't? Is it eye appeal? The steam locomotive is the most fascinating, colorful and lifelike machine ever invented by man. Who hasn't thrilled at the sight of one of these ponderous behemoths hurtling across a clearing, its driving rods beating the rails like a Gargantuan animal of the prairie, and then disappear in its billowing smoke screen?

Wm. Hudnall, 1070 Trigg Ave., Memphis, Tenn.

The School of Hard Knocks

What is the good of a beautiful dining car with fine food and service if, at any moment, you may have your luncheon or dinner plate dumped in your lap by a rough start or stop? What good are finely appointed sleeping cars if one is bumped from one end of the berth to the other? It seems to me that if the railroads really want passenger traffic they should teach their enginemen how to properly handle passenger trains. The railroad man's first response will be that wartime conditions resulting in long trains are the cause of this, but my experience before the war was that trains were poorly handled then. There are a few exceptions to this, among them the Milwaukee and the B&O. If these roads can do a good job why can't the others?

D. R. Davis, 1010 Birdsall St., Old Hickory, Tenn.

Three in One

As I have been pulling the Northern Pacific's *North Coast Limited* (No. 1 and 2) for over two years, the picture of the three tracks which run through Silver Bow Canyon (September 1944 TRAINS) was very familiar to me. I have often gone under this bridge as the ore train was running over it, and I have passed a good many trains going both directions in the canyon. It is a coincidence that on September 30, 1944, the ore train was in practically the same place as in your picture, and I (No. 1) and a westbound freight on the Milwaukee were running neck and neck under the bridge. I thought at the time that a photographer should have been there to get all three of us at once.

O. F. Clarke, 122 E. Broadway, Missoula, Mont.

SECOND SECTION

Jack and Bill Pontin, along with Henry Stearns, head Rail Photo Service, which recently moved to new headquarters at 93 Massachusetts Ave., Boston 15, Mass. Rail Photo Service sponsors the Railroad Photographic Club, whose members have been such frequent contributors to TRAINS as to almost be considered part of our photographic staff, and also operates a London office, Collings-Turner Ltd.

For over 25 years Jack Pontin has been the leader of a group known for excellent photos of locomotive and train action. He and other club members have more than 250,000 negatives listed in their files. Bulletins of rare or select photos are listed and the collector of good railroad pictures can be certain of a remarkable selection at reasonable prices.

In 1929 Jack founded the Boston Association of Model Engineers and in 1933 he organized the National Association of Railroad Enthusiasts, which made the first railfan trip over the Boston & Maine Railroad.

When the editorial staff of TRAINS was fortunate enough to obtain an original of the 1851 "American Railway Guide," we realized immediately that anyone interested in early American history and particularly railroading would appreciate a copy. A page by page facsimile was made of the original, which includes timetables of some 200 railroad routes as well as information about canal and river routes with the distances and fares for all and a large folding map of the railroads of 1851. The book has been reproduced faithfully, even to all of the original typographical errors. The tremendously interesting advertisements lyrically offer pills, clothing, fire proof paint, and medical services. The "American Railway Guide" for 1851, 160 3" x 5¼" pages with heavy paper cover can be obtained from the publishers for $1.

One of the first electric railfan trips of the long-awaited postwar days is being planned by the Bay Areas Railfans' Association, P. O. Box 730, Vallejo, Calif. The trip, tentatively set for Sunday, January 20, will cover the existing street railway lines of the Sacramento City Lines, which intends to convert to bus operation, and the former Central California Traction and Sacramento Northern local lines. Part of the trip's proceeds will finance the rebuilding of the organization's recently acquired Niles passenger trailer car No. 53, which is the last car of its type in California. No. 33 is now in the Sacramento Northern Shops in Chico, Calif., in need of complete overhauling. The association hopes to obtain the Yosemite Valley observation car No. 330, and may have this on hand for use on the January fan trip.

The excursion cost will be $1.50 ($1.25 if reservations are made in advance), not including SP train fare into Sacramento. Reservations and further information are available from William S. Billings, 310 Highland Ave., Piedmont 11, Calif., or Ken Kidder, 1948 Pacific Ave., San Francisco 9.

KALMBACH PUBLISHING CO.
1027 N. 7th St. Milwaukee 3, Wis.

RAILROAD AVENUE, by Freeman H. Hubbard, 374 pages, 6" x 9". 57 illustrations. $3.75. Whittlesey House, 330 W. 42nd St., New York 18, N. Y.

It's a gossipy book, "Railroad Avenue," rambling easily from one subject to another, but concerned never to confuse truth and fancy. Freeman Hubbard, a *Railroad Magazine* editor, has taken a lot of trouble to get correct versions of songs like "Casey Jones," "Jawn Henry," "The Wreck of the Old 97," and his own favorite, "Hoghead's Dying Request." When he gives the story of Jesse James, Kate Shelley, the Andrews raid, and the great Hinckley fire, you're pretty sure his version is the most accurate going. In many cases he has hunted up survivors or their families. The choice of material is excellent and some very good pictures clinch the nostalgic effect. "The Crane with a Broken Neck" tells about the blacklisting watermark on service letters given to American Railroad Union men who were active in the 1894 strike. Somehow this chapter achieves a more real flavor than the famous yarns, perhaps because Hubbard addresses it to all old timers who had that and similar trials. A good list of railroad lingo finishes the book.—*M. C.*

What Is a Full Crew?

In these days of union demands for "full crew" laws and the like, it is of interest to note that on one of the country's streamliners, it takes 44 employees to operate the train. These include engine and train crew, dining car staff, porters, passenger representative, etc. Ten years ago many trains of the nation were not handling that many revenue passengers.

Royalty in Transit

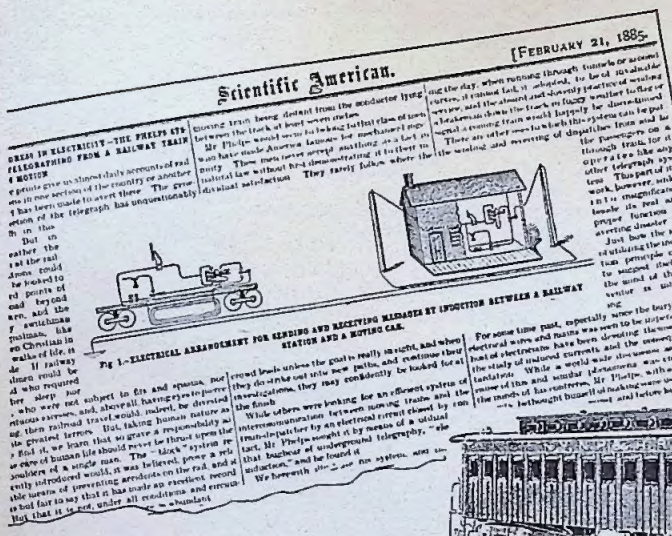
People were not always as enthusiastic about speed on railroads as they are today. When trains first began to run in England, it was months before Queen Victoria could be induced to set foot in one of the pesky things. Railroads were considered "leveling and vulgar," and the speed shocking. In February, 1842, however, Prince Albert made the trip to London from Windsor by rail. When he stepped off the train, he said imperiously to the conductor, "Mr. Conductor, please—not quite so fast next time."

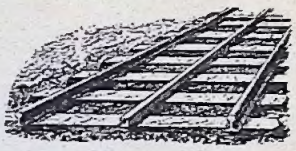
How to Recognize a Railroader

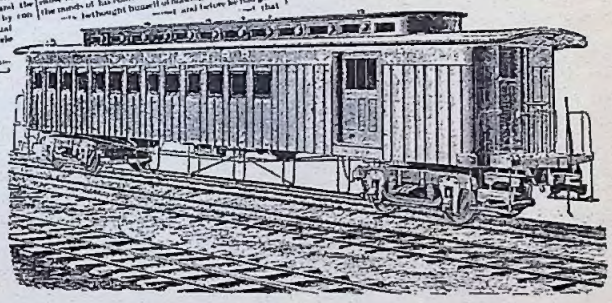
Three things a man does around railroad tracks and yards identify him as a capable railroader no matter how he's dressed, says C. L. Earle, safety expert of the Central Vermont Railway. The identifying actions are: Looking both ways before crossing a track, stepping over and not on rails and keeping at least 10 feet from the end of standing cars.

This double turntable at Cologne, Germany, was used by the 708th Railway Grand Division of the Second Military Railway Service. The damage the Allies inflicted on Cologne is evidenced by the bombed out structures.

708th Railway Grand Div., 2nd Military Ry. Ser., U. S. A.


Scientific American.
[FEBRUARY 21, 1885.





In 1885 an article in Scientific American described a new system of train communication by use of electrical induction. After several months of successful operation on the New Haven Railroad, the system was discontinued.

Early Train Telegraphy

Train communication equipment would seem not to be a brand new idea: In 1885 the New Haven Railroad experimented on its Harlem River Branch with "The Phelps System of telegraphing from a railway train while in motion." The inventor worked on the principle that if two wires are extended parallel near each other, a current sent through one will excite a momentary current in the other, in the opposite direction. Phelps arranged a telegraph wire in the center of the track and attached another wire to the bottom of the car. This was connected to a telegraph sounder inside. A signal sent through the track wire produced a corresponding current in the wire beneath the car, which was transmitted to the sounder. Messages sent from the moving train were taken up by induction by the track wire.

The track wire, encased in a wooden box, passed beneath crossings through an iron pipe. After several months of successful use, the company arranged with Western Union to communicate with any part of the United States from the Harlem River Branch.

The Phelps Company grew through several consolidations, but eventually train telegraphy died out. Possibly the equipment required to pick up the comparatively weak signal was too sensitive to stand continuous service without the aid of electronic devices to amplify currents.

The First Iron Rail

The first solid iron rail ever made in the United States was made at the Mt. Savage Mill in Mt. Savage, Md. This rail was used on the Cumberland & Pennsylvania Railroad which still has its main shops there.—*Edward Flanigan.*

40,000 Miles Before Coming Home

For a few hours last year, Rio Grande Railroad officials had a chance to see No. 65183, a boxcar which, according to the records, is owned by the Rio Grande. It had been so long since they last saw the car, they were almost inclined to question the records. The car left home January 1, and before its wheels again rolled on a Rio Grande rail nearly six months later, it had traveled more than 40,000 miles over the rails of 19 other railroads, crossed the nation five times, and made miscellaneous north and south trips and side excursions. It even rolled through part of Canada.

Made in Dunkirk

Dunkirk, N. Y., long a center of locomotive manufacturing, is still in the business. Its connection with railroads began in 1851, when it was the western terminus of the Erie Railroad. After the Erie's locomotive repair shops had been abandoned for several years, Horatio Brooks and his associates opened the shops in 1869 to manufacture locomotives.

The Brooks Locomotive Company became part of the American Locomotive Company in 1901; by 1913 the Dunkirk plant was manufacturing nearly two locomotives a day. The plant made high explosive shells for the British army at the start of World War I, but returned to locomotive manufacture in 1917.

In 1928 Dunkirk built its last engine, for railroads had reached their saturation point for a time. The plant had turned out 13,235 units in 60 years of building.

Dunkirk now houses Alco Products: oil refining equipment, Diesel and steam locomotive parts.

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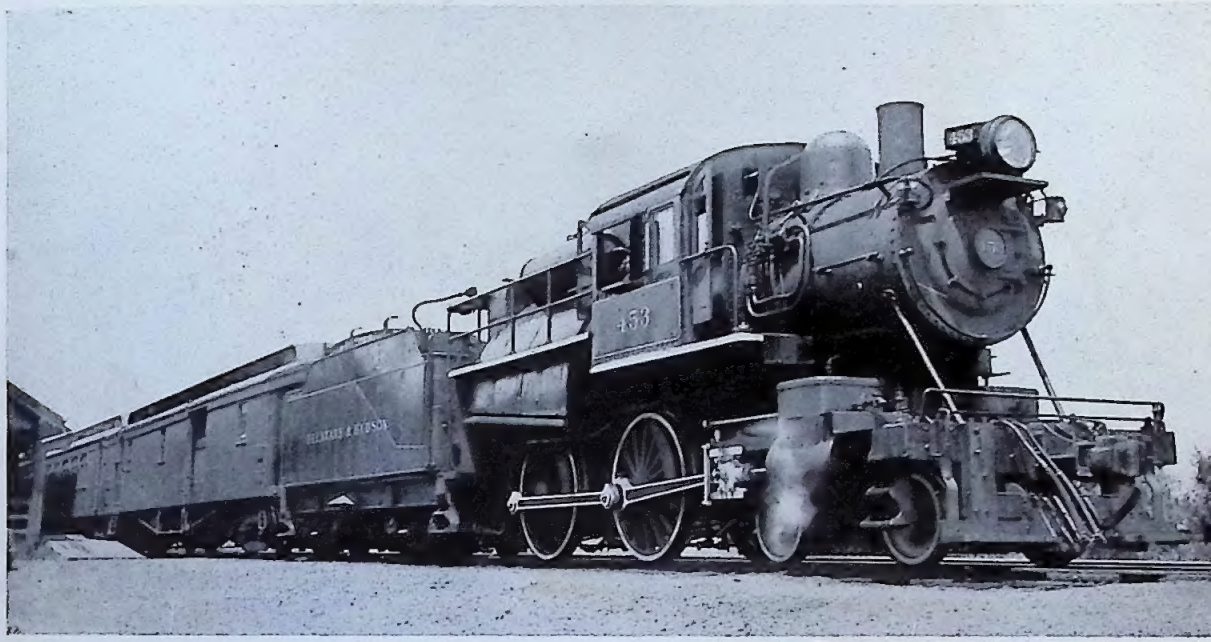

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